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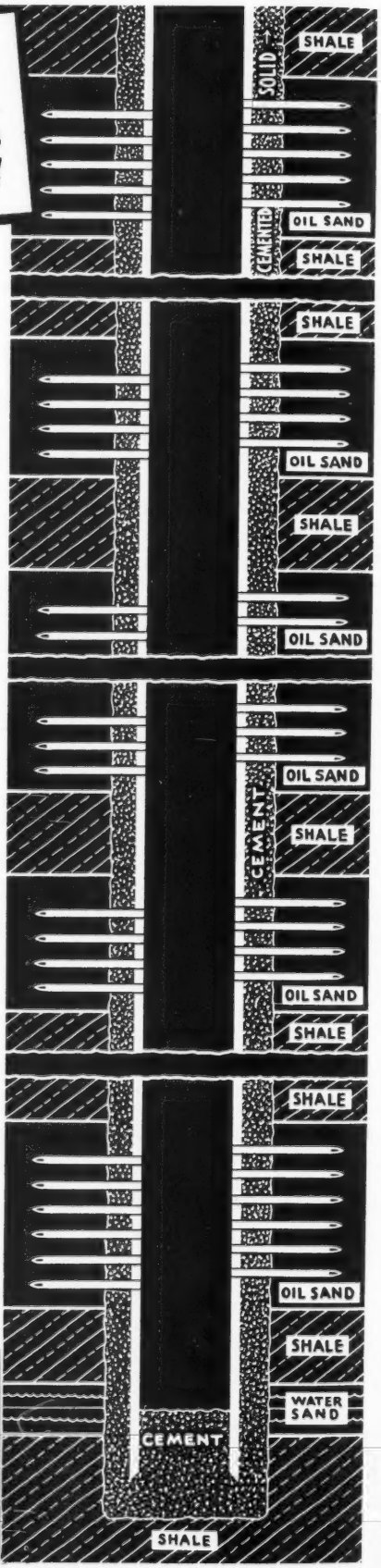

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Carrington King

With the smoke of battle from the November 7 elections cleared away, the Nation's capital has returned to something approaching normal.

On the surface, the Washington set-up is virtually the same as it was before the Roosevelt Administration was returned to power. Such changes as were made in the ranks of the House and Senate will not become apparent until the 79th Congress convenes in January; Cabinet changes, if any, have not yet been announced; barring some unforeseen emergency, the Government will rock along until after the Christmas holidays before the shake-down cruise of the "new" Administration begins.

The new term will be started under circumstances never before encountered in the history of the Nation. The war effort probably is at its peak, both in Europe and in the Pacific. Supplies for all fronts are as urgently needed as they have been at any time during the three years since Pearl Harbor. New demands may have to be made upon the individual, upon industry and upon the Nation as a whole, if the tempo of the Allied drive on Germany and Japan is to be maintained at its present breathless pace.

Most observers agree that President Roosevelt was reelected largely because of his war record and because the voters were not prepared to risk a change of administration when the progress of the war might be affected by such action. Post-election comments—from Republicans and Democrats alike—indicate the Nation is united in its resolve to cooperate, regardless of any hard feelings that might have been engendered in the recent hot campaign, until the winning of the war is a reality.

With this the National attitude, it is to be expected both factions in Congress will make a sincere effort to work together in the months to come. By its vote of confidence in the party responsible for the conduct of the war, the country served notice that the war shall be made the first order of business. Repudiation of the leading Congressional isolationists at the polls and the election of many new members whose records indicate a lively interest in war and post-war problems was further proof that the voters expect Congress to stay in there pitching against the Axis.

All of this seems well understood by the 79th Congress. But the fact that the first months of 1945 should produce some earnest team-work on legislative matters concerning the war and the coming peace does not mean there will be no bickerings and battles in Congress.

As the war enters its fourth year, with victory virtually in sight, American industry is growing restive. With an excellent record of tolerance and cooperation so far, the big business interests quite naturally are beginning to strain towards the day when they will take up their peacetime programs.

Government restrictions and regulations are daily becoming more onerous—as profits mount and postwar opportunities beckon. Industry also is on its toes, to see that it will lose no privileges when the time comes for the important peacetable discussions.

Where the oil industry is concerned, the fight looming over the Anglo-American petroleum treaty is an excellent example of what is likely to happen when Government proponents of a postwar proposal clash with its industry foes.

The treaty — drawn up after lengthy sessions with the British last summer—is due for a public overhauling before the Senate Foreign Relations Committee early in the next session of Congress. According to Chairman Tom Connally (D., Tex.) the matter will be taken up as soon as the Senate group has disposed of another controversial treaty proposal covering the "gift" to Mexico of a large amount of water from the Colorado River water system. . . . This probably means there will be a delay on the oil treaty of several weeks—if not months—after Congress convenes in January.

Meanwhile, the hotly-contested oil agreement is being tossed back and forth like a hot potato by the Petroleum Industry War Council and its National Oil Policy Committee.

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changes in the language in which the treaty was drafted, the industry group is supposed to produce its own version of the agreement at the December PIWC meeting. It is expected, however, that some attempt will be made to straddle the issue.

The Policy Committee is in a more uncomfortable spot than the parent organization—PIWC. For many of the ideas embodied in the treaty stemmed from the report, two years ago, of the Foreign Operations Committee—an industry committee appointed by the Petroleum Administration for War—and this report finally received the general endorsement of the National Oil Policy Committee. The committee, therefore, cannot do a right-about-face without causing embarrassment to itself and to those industry representatives responsible for the blueprint report.

PIWC feels itself under no such restrictions. Although a resolution excoriating the Anglo-American treaty was voted down at the last Council meeting, opposition to the agreement—led by George A. Hill, Jr., Joe Pew, Ralph Zook and others—has increased to a point where the lid almost certainly will be blown off in the future. Whether the blow-off will occur at a PIWC meeting or at the Senate hearings, remains to be seen.

Some oil men are concerned over the effect a knock-down-and-drag-out fight over the treaty might have upon the industry's relations with PAW. If the industry does not deal in a forthright, reasonable way with the issue, it is feared the "model" relationship between the oil industry and PAW will be irreparably damaged.

Washington correspondents who have watched industry-Government relations in other fields than oil have had a sincere admiration for the teamwork displayed by the oil industry and the PAW. Without the whole-hearted cooperation that prevailed during the anxious days when the existence of the Nation depended on our ability to outproduce Germany and Japan in aviation gasoline and all types of petroleum and to build from the ground up a synthetic rubber industry, the United Nations might by this time have gone down to defeat. The oil industry and PAW functioned with an enviable smoothness and an admirable lack of friction at a time when other industries were openly brawling with their Government representatives.

Today, with most of its appalling production problems licked and the end of the war in sight, the oil industry—and all its sister industries—is reasserting its independence.

This reassumption of power on the part of private industry is quite normal and quite commendable. When the war is over, business will want to shake off Federal control at the earliest opportunity. But the war isn't over.

If the oil industry decided to turn the Senate hearings on the Anglo-American treaty into a front-page sensation, some observers believe the public reaction may be harmful. The industry has received much favorable, and well-deserved, publicity during the war years by its remarkable achievements in "oiling the war," it is argued. This newfound public sympathy might evaporate in any bang-up public row between the oil companies and those who are striving to produce an equitable understanding on petroleum matters between this country and the other countries of the world.

Regarding the treaty itself, there is a distinct possibility the President may withdraw the document and—after making alterations designed to meet some of the industry's complaints—resubmit it in the form of an executive agreement. Both the State Department and PAW are said to be willing to insert new language into the agreement, assuring the industry that the U. S. in no way is seeking control of its affairs.

Contrary to the outlook earlier in the fall, when the collapse of Germany appeared to be a matter of weeks, the prospect for increased civilian oil supplies seems gloomy, indeed. We will "just barely get by" this winter without further reductions in gasoline and home heating fuel allotments, according to Deputy Petroleum Administrator Ralph K. Davies.

The tremendous drain into the Pacific area of oil needed to fuel the fleet and maintain our air forces, and continuing military operations in the European theater have combined to unsettle the transportation situation throughout the country.

Tankers that have been operating on the Atlantic Coast now are being withdrawn—presumably for use in the Pacific, where the Philippines operations have created a heavy demand for oil with which to refuel the fleet. At the same time, military needs have pulled off tank cars from Eastern areas dependent upon this form of transportation.

The sudden call for more petroleum products from both the Pacific and the European combat areas and its consequent effect upon the oil transportation pattern was a "shock" that is receiving careful study by PAW, Davies declared. In addition to a tight situation prevailing in gasoline and heating oils, the flow of fuel oil to East Coast refineries also is being hampered, he indicated, and this will retard the production of 100 octane. Oil will have to be moved in barrels and box cars, in some parts of the East, he predicted—a costly and unsatisfactory means of transportation that was resorted to in the early days of the Eastern oil famine.

Two Senators who have lined up consistently against the oil industry were washed out of office in the recent elections. The loss of Gerald P. Nye (R., N. Dak.) will not be mourned by the California oil industry, as Nye was the leading figure in the long fight to wrest title to California's offshore oil deposits away from the State and establish it in the United States Government.

Sen. Guy M. Gillette (D., Ia.), who fought the petroleum industry at every turn, in his anxiety to get a larger cut of the synthetic rubber program for the farm interests through the manufacture of rubber from alcohol, also went down to defeat.

Loss of Rep. Wesley E. Disney (D., Okla.), one of the few men in Congress with a genuine oil background, was a real blow to oil men. Champion of the drive for higher crude prices and friend of all legislation helpful to the industry, Disney was defeated in the primaries when he tried to run for the Senate.

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(Continued on Page 40)

View showing VARCO slips in use on world's deepest oil well located eleven miles east of Taft, California. Depth 15,800 Ft.

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Exploratory Activity and Oil and Gas Discoveries in California - 1944

By Albert I. Gregersen[2]
District Geologist, District 5, Petroleum Administration for War.

It has been the custom of the Pacific Section of the A.A.P.G. to have presented at its annual meetings a paper setting forth the discoveries of oil and gas in California during the year immediately preceding the meeting. In this paper, only the first nine months of 1944 will be covered since the entire year 1943 has already been covered in a paper which W. W. Porter and the author prepared, and which was published in the June Bulletin of the A.A.P.G. Reference to any discoveries made between last year's meeting and the end of 1943 would therefore be repetitious.

The number of wildcat discoveries of oil and gas fields during the first nine months of 1944 is very impressive. The amount of oil discovered is depressive. On the other hand, the gas discoveries appear to have greater potentialities, and two or three may turn out to be of major importance. At this date it is difficult to evaluate these gas discoveries in view of the scanty knowledge of the structures involved. Performances of the discovery wells, however, are encouraging.

In classifying discoveries and exploratory results, the author has been guided by the classification of Dr. F. H. Lahee which has been adopted generally in the development of statistics on exploration. Some modification has been made in this paper in order to make the data comparable to those presented in last year's paper on exploratory results previously referred to. Figures in this paper comparing results with those of last year are classified in the same manner.

Wildcat Oil Discoveries

During the first nine months of 1944 there were 24 wildcat discoveries of oil in California. If the same rate of discovery continues during the last three months of the year this will doubtless be a record year in the number of fields discovered. On the other hand, it may come close to being the poorest wildcat discovery year in terms of reserves of oil discovered.

Of the 24 new fields only two can be considered of major importance so far. One of these is the **Jacalitos Northwest** Field, the discovery well of which was Standard of California's Fee Well No. 67-17E, completed on February 1 in Section 17-21s-15e, Fresno County. This well had an initail production of 3500 MCF daily of lean petroleum gas. A second well, drilled by Tide Water Associated Oil Compaany, discovered a black oil belt. This well, Jacalitos No. 27-16 in Section 16-21s-15e, was completed July 4 flowing at the rate of 614 barrels per day. Production comes from sands of Temblor age. A third well, Standard of California's 81-21e, has extended the field approximately one mile southeasterly.

Another oil discovery, possibly second in importance during the first nine months of 1944, was made by Rothschild & Bender Oil Operations in its Sheep Springs No. 2 well drilled in Section 17-29s-21e, Kern County. The well was completed on September 22 in the Carneros sand of Middle Miocene age between 3456 and 3485 feet, flowing at an initial rate of 1000 barrels daily. Accumulation appears to be on a faulted anticline. A well previously drilled by Los Nietos Company, Sheep Springs No. 1, in Section 20 about one-quarter mile south did not encounter any production, being located in or southwest of the North-

Exploratory Results—Calif.—First 9 Months—1944

Results of Exploratory Drilling—Table I—Dry Holes

	WILDCAT DRY HOLES			
	No. Holes Drilled		Footage Drilled	
	1st 9 mos. 1944	1943	1st 9 mos. 1944	1943
Surface Geology	31	38	117,733	161,882
Subsurface Geology	67	36	231,520	127,749
Surface and Subsurface Geology	4	16	14,967	60,578
Total Geology	102	90	364,220	350,209
Seismograph	33	27	205,876	164,326
Seismograph and Surf.-Subsurf. Geology	6	6	45,387	45,385
Seismograph and Surface Geology	0	2	0	11,072
Random Drilling	17	40	61,037	112,666
Total Wildcat	158	165	676,520	683,658
	DRY HOLES OTHER THAN WILDCAT			
Other than Wildcats	44	58	242,395	265,563
Total Exploratory Dry Holes	202	223	918,915	949,221

Results of Exploratory Drilling—Discoveries—Table II

	WILDCAT			
Surface Geology	9	0	40,074	0
Subsurface Geology	9	8	22,785	32,846
Surface and Subsurface Geology	1	2	4,768	8,826
Total Geology	19	10	67,627	41,672
Seismograph	8	10	54,227	64,703
Seismograph and Surf.-Subsurf. Geology	3	1	22,491	8,351
Seismograph and Surface Geology	0	0	0	0
Random Drilling	0	0	0	0
Total Wildcat	30	21	144,345	114,726
	OTHER THAN WILDCAT			
Other than Wildcats	31	28	196,428	139,327
Total Discoveries	61	49	340,773	254,053
TOTAL EXPLORATORY DRILLING	263	272	1,259,688	1,203,274

west-Southeast trending fault which is responsible for the accumulation.

Eight other oil discoveries are considered to be of commercial importance at this date.

(1) **Mt. Poso-Vedder** was discovered by D. G. Vedder in his Well No. 3-18 in section 18-27s-28e. Well was completed on February 2 at an initial rate of 125 barrels daily from the Vedder sand.

(2) **Lanare-Eocene** was discovered by Amerada Petroleum Corporation in its California Lands Company 65-15, Section 15-17s-18e, Fresno County. This well, completed January 27, was drilled about 3000 feet north of The Superior Oil Company's Kreyenhagen No. 81 in Section 22-17s-18e, the discovery well of the Lanare Field, which was productive in the Temblor and not in the Eocene. Conversely, the California Lands 65-15 well was not productive in the Temblor, but did discover production in the Eocene. This area is separated from the Helm Field by a dry hole General Petroleum's Noble 65-88.

(3) Tide Water Associated Oil Co. discovered a new field with its Porter 24-18 well in Section 18-30s-29e, Kern County. Well was completed May 18, flowing at a rate of 500 barrels daily from a sand of Santa Margarita age. This field lies north of the Mountain View Field and the Mountain View Fault.

(4) On May 10, The Superior Oil Company discovered the **Bellevue Field** about four miles southeast of the Greeley Field along the Rio Bravo-Greeley trend. The discovery well, Houghton 36-35, was completed May 10 flowing 1900 barrels daily from the Stevens Zone. Two dry holes and two producers have subseqeuntly been completed in this field. The areal extent appears to be very limited.

(5) An important discovery from a regional geological point of view is the **Antelope Plains Field** discovered by Shell Oil Company's Hopkins Fee No. 57X31 in Section 31-27s-20e. This well was completed June 22 flowing 240 barrels daily from an interval of Eocene sand between 2485 and 2515 feet. This is now the most southerly Eocene production on the west side of San Joaquin Valley.

(6) On July 2, Independent Exploration Company completed its discovery well of the **Premier-East Field.** The well, Conoco No. 3 in Section 33-27s-27e, had an initial flowing production of 250 barrels daily from an interval of Etchegoin sand between 2268 and 2349 feet.

(7) British-American Oil Producing Company discovered the **Race Track Field** in its Portals No. 53-3 well in Section 3-30s-29e, Kern County, northeast of the Edison Field. The well, completed on September 16, had an initial production of 240 barrels daily. Production comes from the Jewett silt of Lower Miocene age.

(8) The **Mt. Poso-Glide Field** was discovered by Harry Magee on May 11 in his Glide 2-11 in Section 11-27s-28e, Kern County. Initial production was 25 barrels daily coming from the Vedder sand in the interval 1280-1300 feet.

The remaining 14 wildcat discoveries are, at the present stage of development of such a character that they cannot be considered of commercial importance and will not be specifically referred to in this paper.

Wildcat Gas Discoveries

Six wildcat gas discoveries have been made in California during the first nine months of 1944. All of these are of commercial importance and four of them may prove to be major gas fields after development furnishes more data on their areal extent. It is of interest that all of these gas discoveries were made as the result of seismograph surveys.

Since all of thes fields appear to be at least of commercial importance some of the pertinent data relating to the discovery wells will be given.

(1) The **Honker Field,** which lies at the east end of Suisun Bay in Solano County, was discovered April 7 by Standard of California in its Honker Community No. 1-A well. This was the second well drilled on the structure. The first, Suisun Community No. 2-1, drilled 150 feet away was abandoned for mechanical reasons. The discovery well, located in Section 25-3n-1w, was drilled to a depth of 8304 feet. Production comes from an interval of Eocene sand between 7190 and 7429 feet. Initial production was at a rate of 3200 MCF daily.

(2) Another gas discovery, the Suisun Gas Field, was made in Standard of California's Suisun Community No. 3 well in Section 5-3n-1w, Solano County, at the north end of Suisun Bay. This well is about six miles northwest of the Honker discovery. It was completed on September 29 at an initial rate of 7350 MCF daily from the intervals 3410-3490 feet and 3500-3640 feet. Another interval not opened on completion between 3875 and 3949 feet flowed at a rate of 8000 MCF daily on a test. This production is probably from sands of Eocene age.

(3) The Amerada Petroleum Corporation made another important discovery on August 28 in its Starkey Fee No. 1 well in Section 2-6n-2e, Solano County, about twelve miles north of Rio Vista Gas Field. This has been called the **Dixon Field.** The well was drilled last year to a depth of 9430 feet, but was suspended. Completion occurred in August 1944, when an interval between 4550 and 4600 feet was opened to production with an initial rate of 22,570 MCF daily. Production comes from sands of Eocene age. This appears to be a discovery of major importance.

(4) **Trico Northwest,** a new gas field, was discovered September 4 by Standard of California in its Cutter No. 1 well in Section 29-23s-22e, Kings County, about eight miles northwest of the Trico Gas Field. Production comes from a sand equivalent to the "C" Zone of Pliocene age in the Trico Field. Initial production was at the rate of 7616 MCF daily.

(5) Richfield Oil Corporation made two gas discoveries during the first nine months of this year. The **Chico Gas Field** in Butte County was discovered by its Chico No. 1 well, drilled to basement at a depth of 7005 feet. The well was completed on January 2 in an interval between 4365 and 4390 feet in sand of Cretaceous age at a rate of 3200 MCF daily. The field, located about five miles southwest of Chico, is the most northerly gas field in California.

(6) Another gas discovery by Richfield is the **Afton Field** which was found by drilling Afton Community No. 1-1 well in Section 34-19n-1w in Glenn County just east

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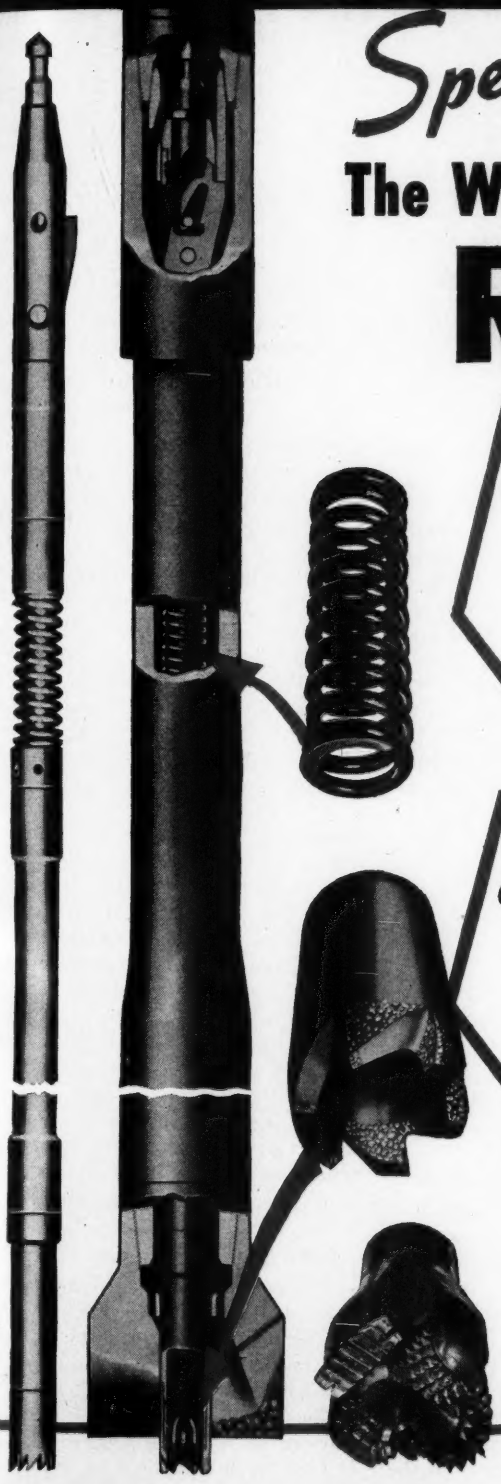

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of the Sacramento River. The well was drilled to 5252 feet but was plugged back and completed on February 13 in an interval from 2648 to 2660 feet at an initial rate of 4500 MCF daily. Production comes from a thin sand near the top of the Cretaceous.

New Pool Discoveries and Outpost Successes

During the first nine months of 1944 31 successful new pool tests and outposts have been completed in California. Either one of the largest two of these has far exceeded in amount of reserves discovered, the total wildcat discoveries during the period. This is not unlike last year's record.

Four of these successful new pool tests and outposts are of such importance that a few remarks about them are in order.

(1) The most outstanding appears to be the new pool discovery made by Standard of California in its Well Fee No. 27B-54 in Section 27-31s-23e in the Buena Vista Field. This well was completed March 23 flowing at the rate of 625 barrels daily from the interval 4360 to 4438 feet. The producing sand lies at the base of the Pliocene.

Up to October 1, 23 producers had been completed in this zone. On that date production extended for three miles along the Buena Vista Anticline from Standard of California's Well No. 331 in the NW ¼ of Section 1-32s-23e to Standard's Well No. 378 in the SE ¼ of Section 21-31s-23e. To date indications are that approximately 1400 acres have been proved by drilling. At an estimated recovery of 25,000 barrels per acre, about 35 million barrels of oil have been added to the state's proved reserves by this new pool discovery.

(2) Next in importance among new pool discoveries is Continental Oil Company's Grubb No. 31 well in Section 24-3n-24w in the San Miguelito Field, Ventura County. This well opened a new pool with production coming from the interval between 7225 and 7700 feet in sands of Pliocene age. Initial production was 1558 barrels daily and 1600 MCF per day of gas. This discovery emphasizes again the great potentialities of deeper zones in the fields along the Ventura Avenue-Rincon trend, in which a large part of the Lower Pliocene section and none of the underlying Miocene and older possibilities have been tested.

(3) An important deeper zone discovery of gas which may eventually equal or exceed the Buena Vista and San Miguelito new zone discoveries in economic importance was made in the Rio Vista Gas Field by Standard of California in its Perry Anderson Well No. H-6 in Section 36-4n-2e. The producing interval of Eocene age from 5735 to 5830 feet is the third gas zone discovered to date in this field. Initial production was at a rate of 16,704 MCF daily. Subsequent drilling indicates that faulting and other irregularities may complicate the development of this zone, but regardless of this the known gas reserves of the field have been very materially increased by this deeper zone discovery.

(4) One important successful outpost well has extended the North McGrath Pool in the Seal Beach Oil Field. This is Shell Oil Company's Bryant No. 5 well in Section 11-5s-12w which was completed on August 13 flowing at a rate of 1602 barrels per day from an interval of the Upper and Lower McGrath Zones. This well extended the area of North McGrath Zone production which now appears to have proved reserves of approximately 5 million barrels. Other drilling under way in the area may add considerably to this figure. It may be of interest that this Company's Bryant No. 2 within the newly productive area, drilled about 1928, stopped and was abandoned only 500 feet above the presently producing zone.

Discovery Percentage 1943-1944*

	WILDCATS			
	Footage		Number of Holes	
	1st 9 mos. 1944	1943	1st 9 mos. 1944	1943
Surface Geology	25.4	0.0	22.5	0.0
Subsurface Geology	9.0	20.5	11.8	18.2
Surface and Subsurface Geology	24.2	12.7	20.0	11.1
Total Geology	15.7	10.6	15.7	10.0
Seismograph	20.5	28.3	19.5	27.0
Seismograph and Surf.-Subsurf. Geology	33.1	15.5	33.3	14.3
Seismograph and Surface Geology	0.0	0.0	0.0	0.0
Random Drilling	0.0	0.0	0.0	0.0
Total Wildcat	17.6	14.4	16.0	11.3
Exploratory other than Wildcats	44.8	34.4	41.3	32.6
TOTAL EXPLORATORY WELLS	27.1	21.1	23.2	18.0

*—First 9 months only.

Exploratory Activity and Results

First Nine Months of 1944 and the Year 1943

A few comparisons between exploratory activity and results in California in the first nine months of 1944 and the year 1943 may be of interest.

That exploratory drilling in 1944 is going on at an increased rate over last year is indicated by the fact that during nine months of this year 188 wildcats were completed compared with 186 during all of last year—an increase of 33 1/3 per cent.

Likewise, 820,865 feet of wildcat hole was drilled in nine months compared with 798,384 feet in all of last year.

A comparison of exploratory drilling other than wildcats, i.e., new pool tests and extensions, shows that activity in this category is also about 30 per cent ahead of last year.

The total exploratory footage drilled up to October 1 was 1,259,688 feet, or 238 miles against 1,203,274 feet or 228 miles, for all of last year. In other words, 56,000 more feet of exploratory hole was drilled in nine months of this year than was drilled during all of last year.

Depth of Exploratory Holes

The average depth of exploratory holes drilled in California has gone up from 4424 feet in 1943 to 4790 feet in 1944, an increase of 366 feet per hole.

The average depth of wildcat holes increased from 4292 to 4366 or 74 feet per hole.

Wildcats drilled on seismograph plays showed an average increase of 154 feet—from 6085 to 6239 feet in 1944.

The greatest increase in average depths took place in wildcat wells drilled at random. Last year the average depth of such wells was 2815 feet, but this year it has increased to 3590 feet—775 feet per well. This may indicate a more venturesome spirit on the part of those already venturesome "wildcatters" who operate without benefit of geology or geophysics.

Method of Wildcat Exploration

Looking toward the future of exploration, it is interesting to note how the various types of exploration contributed to the wildcat oil and gas discoveries during the first nine months of 1944.

Geological exploration has been responsible for 19 discoveries, of which nine were based on surface geology; nine on subsurface geology; and one on a combination of subsurface and surface geology.

Next in importance were discoveries due to seismograph exploration, of which there were eight. Six of these were gas and two oil.

The remaining three wildcat discoveries were due to a combination of seismograph and subsurface geology.

Who Made Wildcat Discoveries

It may be of interest to know who made the wildcat discoveries in California during the first nine months of 1944.

Standard of California heads the list with six discoveries — three oil and three gas discoveries, or 20 per cent of the total wildcat discoveries. Next comes the Amerada Petroleum Corporation with three discoveries—two oil and one gas, or 10 per cent of the total.

Two discoveries each were made by Richfield, Shell, Tide Water Associated, The Capital Company, and Harry Magee. All of these were oil discoveries, excepting the two by Richfield, which were gas.

Seven operators made one wildcat oil discovery each. These were Rothschild-Bender Oil Operations, Superior Oil Company, British-American, D. G. Vedder, Independent Exploration, General Petroleum and Union Oil Company.

Since the operator who made most discoveries during the year, Standard of California, operated the largest number of strings of wildcat tools, one might be led to include that more drilling is the solution for finding more oil fields. In order not to be disillusioned on this score, the author has not pursued the idea further.

Results of Exploration 1943-1944

Of greatest interest to the management and stockholders, as well as to geologists and geophysicists, are the results obtained from exploratory drilling. This can be expressed in two ways:

1. The percentage of success based on the number of holes drilled or the total footage drilled, and
2. The actual reserves uncovered by exploratory drilling.

Success Percentage

The first of these methods may yield figures which appear far more favorable than the actual results in terms of reserves discovered. It does, however, indicate a measure of success of the exploratory methods used, since finding a small accumulation of oil may often require more precise effort than the discovery of a large accumulation.

On a percentage basis 1944 has been a very successful year so far. Of the total exploratory holes drilled 23.2 per cent were successful compared with 18.0 per cent in 1943. Of the footage drilled, 27.1 per cent was successful compared with 21.1 per cent in 1943.

A breakdown shows that of the wildcats drilled, 16 per cent were successful compared with 11.3 per cent last year. Exploratory wells other than wildcats, i.e., new pool tests and extensions were 41.3 per cent successful compared with 32.6 per cent last year.

Decreases in success percentage were shown in only two types of wildcats. Those drilled on subsurface geology alone were only 11.8 per cent successful this year compared with 18.2 per cent last year. Likewise 19.5 per cent of the wildcats drilled on seismograph plays were successful compared with 27 per cent in 1943. These decreases are significant, since the two categories include two-thirds of the wildcats drilled during the first nine months of this year.

Reserves Discovered

The figures on success percentage might lead one to believe that we have discovered a lot of oil and gas in California during 1944. The author will not attempt to give more than a rough guess as to the reserves found in the first nine months of this year, but, rough as it is, it should indicate that our success, so far as oil is concerned, is technical rather than economic.

Approximately 7,500,000 barrels of oil may have been discovered by wildcat drilling in this period. No attempt to guess at the gas reserves found by wildcatting has been made, but these reserves will be of major magnitude and will undoubtedly overshadow the wildcat oil discoveries.

Other exploratory discoveries i.e., new pool tests and extensions, which have shown such a high success percentage, have also uncovered the most important reserves of both oil and gas. At this stage one may venture an estimate that these will exceed by five or six times the reserves discovered by wildcats during the first nine months of 1944.

Reserves of gas discovered by an important new pool test in the Perry Anderson sand at Rio Vista may approach the total reserves discovered in all the other wildcat gas discoveries in 1944 put together, although an evaluation of either at this time is too hazardous to be of any value.

The total reserves of oil discovered in the first nine months of 1944 is probably less than 20 per cent of the total oil production during the same period. This is about the same as the figure for the year 1943, which was 22 per cent. In other words, we are continuing to use up our reserves five times faster than we add to them.

Conclusions

What are some of the conclusions which may be drawn from a survey of oil and gas discoveries and exploratory activity in California during the first nine months of 1944?

The year 1944 will prove to be the all-time high, to date for exploratory drilling in California. More wildcats and more wildcat footage will have been drilled than in any other year. More wildcat discoveries will have been made than in any other year. The average oil reserves per field discovered

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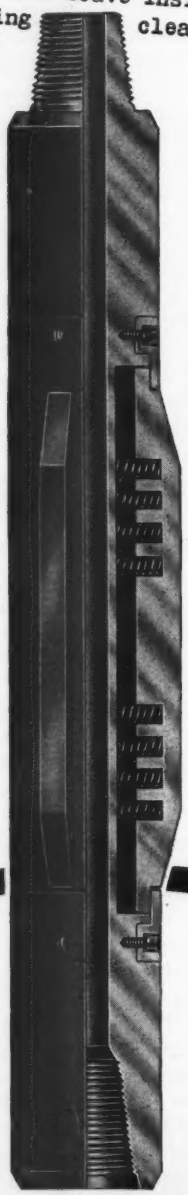
"When we figure how much money that Scraper will save in avoiding damage to packers and swabs it makes the rental look mighty reasonable..."



"By running the Scraper while the equipment is up and the crew on hand, we can leave the casing in smooth clean condition for any future work."

"It sure does take a load off my mind to know that the casing is scraped to its full I.D., and all smoothed up and clean."

"It's important to know that we can set a packer with all rubbers in good shape to pack-off..."

"We have found it good insurance to leave the casing free from hardened cement and other obstructions so that any future work will be safe and easy to do."

"Our crews had no trouble running the Scraper, and we don't see why anyone would need a serviceman."

Results like these make us proud to offer the Baker Rotary Casing Scraper to every operator, because "No Well is Complete Without It."

Look on Pages 357 to 360 of the 1944 Composite (or Baker) Catalog, or better yet—ask any Baker service engineer for information and service.

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BAKER ROTARY CASING SCRAPER

will probably be the lowest for any year in the history of the California oil industry.

A new world's deep drilling record has been established by Standard of California in its exploratory test at Coles Levee, Kern County, now drilling below 15,700 feet. The successful drilling of this well will lead to the testing of a number of good deeper zone prospects which have remained untested because of the great depths involved.

The results of wildcat drilling during 1944 suggest that we are fishing in a stream with a number of small trout left. Our fishing technique is good, but the stream has been largely fished out, although here and there a big steelhead trout may still be lurking in some secluded pool.

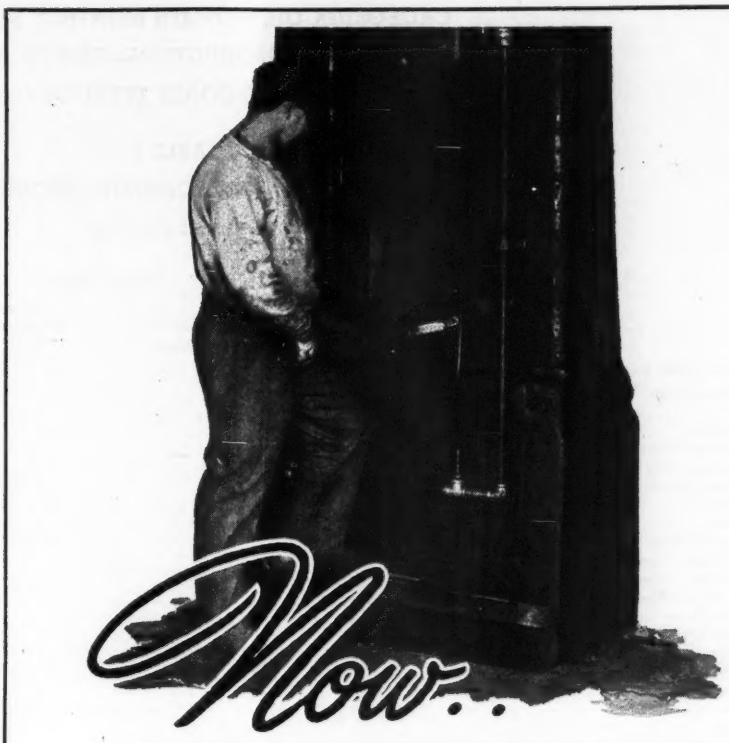
Only the expert and persistent fisherman will be able to hook the big fish which are lurking under the overhanging rocks of the San Cayetano and Oakridge overthrusts in Ventura County, but in time their efforts may be well rewarded.

What we need to look for are new streams where only an occasional fisherman has made a hurried reconnaissance trip. There are, in the author's opinion, such opportunities left in California. Many an operator has cast covetous eyes at some of the excellent fishing pools extending into the closed preserve beyond the coast line of California. The excellent results obtained by some adventurous fishermen who have obtained permission from the State of California to cast a fly in a few of these pools speak well for the future of fishing in that preserve when the State declares an open season. There is some reason to believe that this may not be far off.

How about trying your luck and skill in a new and distant lake, such as the Tertiary Marine Basin of Western Oregon and Washington? There may be many a tricky reef upon which some may strand as they look for new fishing grounds in the remaining new lakes and streams. But is there any reason to believe that the oil industry will not be more than equal to the opportunities of showing its patience and skill at fishing? I believe that the industry is equal to the challenge and that it will still be catching a few "big ones" for some time to come.

Presented before the 21st annual meeting, Pacific Section, American Association of Petroleum Geologists, Los Angeles, Calif., November 10, 1944.

For a complete weekly report on California drilling wells read CALIFORNIA OIL WORLD NEWS SERVICE. Continuously carried locations, elevations, spud dates, etc. affords an immediate summary of EVERY well EACH week.



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Cargo Ships Aid Oil Tankers

Since its adoption two years ago, cargo ships have delivered more than 1,250,000 tons of fuel oil to England alone by carrying the oil in bunkers and double bottoms in addition to the main cargo.

Over 15,000,000 tons will be shipped this year in this manner. Most vessels carry extra bunkers and double bottoms loaded to capacity on each trip.

CALIFORNIA OIL WORLD'S MONTHLY SUMMARY
DEVELOPMENT—PRODUCTION—SUPPLY & DEMAND
PACIFIC COAST TERRITORY

TABLE I
CALIFORNIA DEVELOPMENT—PRODUCTION
September, 1944

	DEVELOPMENT				PRODUCTION	
	Active Drilling Wells	Oil Wells Completed	Initial Production B/D	Oil Wells Completed 1st 9 Months	Daily Average September 1944	Daily Average September 1943
AN JOAQUIN VALLEY						
Antelope Hills	1	2	726	7	2,247	2,206
Arvin	.....	.....	.....	.....	37	39
Bellevue	2	.....	.....	2	815	.....
Belridge—North	1	.....	.....	3	7,168	6,260
Belridge—South	2	19	757	156	11,225	6,938
Buena Vista Hills	9	9	4,064	42	23,463	14,530
Burrel	1	.....	.....	1	25	.....
Canal	.....	.....	.....	.....	3,584	3,765
Canfield Ranch	.....	.....	.....	.....	37	44
Coalinga—East	5	12	793	83	22,599	20,130
Coalinga—Nose	.....	.....	.....	4	69,875	61,479
Coalinga—West	1	4	169	48	7,731	6,286
Coles Levee	5	.....	.....	5	18,023	15,875
Dyer Creek	.....	.....	.....	.....	.....	26
Edison	2	5	691	20	3,322	2,424
Elk Hills	21	16	5,267	34	21,461	16,011
Fruitvale	4	2	53	15	8,654	7,028
Greeley	4	.....	.....	5	14,680	14,082
Helm	3	3	476	12	1,621	576
Jacalitos	3	2	245	6	792	314
Kern Front	6	4	602	73	14,305	12,264
Kern River	6	4	150	27	9,870	8,498
Kettleman North Dome	8	1	565	8	41,535	40,652
Lanare	1	.....	.....	.....	124	56
Lost Hills	.....	.....	.....	3	3,338	3,605
McClung	1	.....	.....	.....	62	18
McKittrick	4	5	547	26	5,306	4,721
Midway-Sunset	17	14	870	104	41,833	41,048
Mountain View	1	.....	.....	3	3,242	3,648
Mount Poso	3	2	45	17	21,068	23,946
Paloma	6	1	757	13	6,712	772
Pleasant Valley	3	2	1,469	8	3,541	1,086
Raisin City—East	.....	.....	.....	.....	441	775
Raisin City—West	.....	1	41	12	2,641	465
Rio Bravo	.....	.....	.....	1	16,788	15,095
Riverdale	4	1	180	15	5,064	2,327
Round Mountain	2	3	149	13	10,142	11,471
Shafter	.....	.....	.....	.....	2	30
Strand—East	.....	.....	.....	2	651	224
Strand—West	1	.....	.....	1	1,777	1,702
Tejon	1	.....	.....	2	147	.....
Ten Section	.....	.....	.....	.....	12,847	17,211
Union Avenue	.....	.....	.....	.....	91	135
Wasco	.....	.....	.....	.....	1,938	2,147
Wheeler Ridge	.....	.....	.....	.....	251	261
Miscellaneous	7	3	89	21	517	.....
TOTAL SAN JOAQUIN VALLEY	135	115	18,705	792	421,592	370,170
COASTAL AREA						
Aliso Canyon	4	.....	.....	6	3,657	2,127
Capitan	.....	.....	.....	.....	2,580	3,266
Del Valle	2	.....	.....	3	2,016	1,212
Elwood	1	.....	.....	3	5,810	4,453
Gato Ridge	.....	.....	.....	4	5,319	2,953
Newhall-Potrero	1	.....	.....	3	5,198	5,285
Oak Canyon	2	.....	.....	1	1,316	803
Padre Canyon	1	1	834	3	1,822	912
Rincon	1	1	272	12	4,470	3,408
San Martinez	1	.....	.....	5	2,686	1,482
San Miguelito	2	.....	.....	3	5,777	4,394
Santa Barbara	.....	.....	.....	.....	86	116
Santa Maria	7	1	298	11	14,401	10,486
Santa Maria Valley	8	9	2,058	67	34,320	23,052
Summerland	.....	.....	.....	.....	4	8
Ventura Avenue	10	4	4,023	27	51,802	42,572
Ventura-Newhall	8	3	591	24	6,723	4,529
Watsonville	.....	.....	.....	.....	25	25
TOTAL COASTAL AREA	48	19	8,076	172	148,012	111,083

LOS ANGELES BASIN						
Brea—Olinda	.....	1	561	6	11,933	11,153
Buena Park	.....	1	90	1	119	110
Coyote—East	3	.....	.....	8	5,473	5,723
Coyote—West	4	1	93	14	12,375	11,797
Domingues	2	2	1,591	8	21,151	24,451
El Segundo	1	.....	.....	2	1,024	1,017
Huntington Beach	5	7	1,337	60	49,233	37,223
Inglewood	2	.....	.....	4	17,325	18,528
Lawndale	.....	.....	.....	.....	29	29
Long Beach	2	.....	.....	4	29,114	31,254
Los Angeles-Salt Lake	.....	.....	.....	.....	518	524
Montebello	2	2	30	7	10,704	10,811
Newport	.....	.....	.....	.....	10	9
Playa Del Rey	.....	.....	.....	.....	2,762	2,657
Potrero	.....	.....	.....	1	1,042	937
Richfield	1	.....	.....	6	7,137	7,286
Rosecrans	.....	3	189	4	6,088	5,784
Santa Fe Springs	.....	.....	.....	.....	18,363	19,483
Seal Beach	7	.....	.....	3	8,289	7,472
Torrance	5	2	105	21	8,793	7,748
Turnbull Canyon	.....	.....	.....	.....	211	340
Whittier	2	1	22	3	1,043	1,042
Wilmington	14	11	2,868	110	104,610	93,624
Yorba Linda	.....	.....	.....	3	773	535
TOTAL LOS ANGELES BASIN	50	31	6,886	265	318,119	299,537
Exploratory Drilling Outpost Wells	16	.....	.....	.....	.....	.....
Wildcats	20	.....	.....	.....	.....	.....
TOTAL CALIFORNIA	269	165	33,667	1,229	887,723	780,790

Data from A.P.I.

TABLE II

SUPPLY AND DEMAND FOR PETROLEUM PRODUCTS
PACIFIC COAST TERRITORY
DATA FOR SEPTEMBER OF EACH YEAR
1938—1944

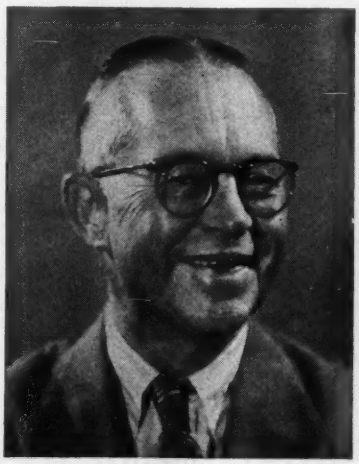
	September 1938	September 1939	September 1940	September 1941	September 1942	September 1943	September 1944
RAW MATERIAL—B/D							
1. Crude Oil Produced—California	664,067	615,433	612,600	646,771	726,401	780,790	887,723
2. Crude Oil from outside 5 Western States	.....	.....	1,933	2,629	3,842	5,277	4,710
3. Natural Gasoline Produced	43,000	38,000	38,000	39,000	37,000	40,000	43,000
SUPPLY OF FINISHED PRODUCTS							
ALL SOURCES B/D							
4. Natural Gasoline and L.P.G.	6,501	1,467	7,600	3,233	5,466	5,233	9,900
5. Gasoline and Naphtha Distillates	229,733	226,433	226,500	256,034	258,300	266,834	327,100
6. Kerosene and Kerosene Distillates	10,200	13,367	7,767	4,734	5,933	8,633	9,367
7. Lubricating Oils, etc.	6,067	11,833	14,700	10,033	11,666	7,700	10,667
8. Gas Oil and Diesel Oil	83,266	80,400	85,300	66,633	74,200	61,000	71,067
9. Fuel Oil Residuum	262,300	253,433	245,933	288,400	393,133	440,000	421,567
10 Asphalt and Road Oils	24,133	23,034	27,599	35,433	45,500	29,200	34,667
11. Coke and Other Finished Products	734	4,700	1,367	4,733	1,167	500	2,666
12. Miscellaneous and Losses	87,400	42,966	41,967	27,535	(16,999)	24,735	77,899
13. **TOTAL SUPPLY**	710,334	657,633	658,733	696,768	778,366	843,835	964,900
14. **TOTAL DEMAND**	618,834	724,333	710,733	703,634	752,967	991,801	901,900
15. **DIFFERENCE**	+91,500	−66,700	−52,000	−6,866	+25,399	−147,966	+63,100
Stocks on hand							
16. End of each month (Total Bbl.)	159,601,000	160,561,000	155,013,000	142,644,000	131,550,000	114,684,000	92,851,000

Data from U. S. Bureau of Mines.
Pacific Coast Territory includes Arizona, California, Nevada, Oregon and Washington.

Sam E. Moyer Appointed Parkhill-Wade Controller

Parkhill-Wade, consulting and construction engineers, 1625 S. Alameda Street, Los Angeles, have announced the appointment of Sam E. Moyer as Controller of that company, effective October 20, 1944.

Sam Moyer is well-known in the oil industry, having been associated with the oil business in California for twenty years. He held the position of Chief Accountant of the Ketteman North Dome Association for the past thirteen years prior to assuming his new duties as Controller for Parkhill-Wade.



Sam E. Moyer

Norris Issues New Bulletin

W. C. Norris, Manufacturer, Inc. has just issued Bulletin No. 34, describing the Norris Tubing Eliminator.

The bulletin is quite complete with charts and drawings and is being made available to all interested persons.

A copy may be obtained from the manufacturer at Tulsa 1, Okla.

For complete technical data on California Drilling Wells, New Operations, Discoveries, etc. subscribe to CALIFORNIA OIL WORLD NEWS SERVICE, a COMPLETE scout report.

THE SCHLUMBERGER FLEET OF STREAMLINE FIELD SERVICE UNITS REFLECTS A DECADE OF PROGRESS AND ACCEPTANCE OF SCHLUMBERGER SERVICES

Louisiana — 1933
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THIS IS THE 10th ANNIVERSARY OF SCHLUMBERGER WELL SURVEYING CORP.

Butane Dehydrogenation by the Houdry Process

R. C. LASSIAT
Houdry Laboratories
Catalytic Development Corporation
Linwood, Pennsylvania

F. D. PARKER
Bechtel-McCone Corporation
Los Angeles, California

Presented at the Fall Meeting of the California Natural Gasoline Association Los Angeles, California

The dehydrogenation of light hydrocarbons has attracted considerable attention in recent years as a means for making the large quantities of natural gas constituents available for manufacture of petroleum constituents, chemicals, and chemical intermediates. At the beginning of the present war, major interest was focused on the production of butadiene,—the principal constituent of Buna-S synthetic rubber. Buna-S rubber production represents approximately 83% of the total planned U. S. synthetic rubber production. (11)

Previous Work

The literature contains numerous references to theoretical and laboratory studies of dehydrogenation yields, operating conditions, and catalysts (6, 8, 10). It has been known for a number of years that normal butane can be dehydrogenated to butylene and butadiene at elevated temperatures in the presence of metallic oxide catalysts. One of the catalysts which is most attractive from the point of view of cost, activity and ruggedness is chromic oxide supported on alumina (1, 2, 3, 9). While the literature indicates that attractive yields are obtainable with this catalyst, the details of catalyst manufacture, operating conditions, heat balances, process and mechanical features of the equipment in which the reaction can be carried out commercially had to be developed by technical groups active in the field. (4, 5, 7)

The basic chemistry of the dehydrogenation reaction is briefly illustrated below:

$n\text{-}C_4H_{10} \longrightarrow n\text{-}C_4H_8 + H_2$
(normal butane) ⟶ (normal butylene + hydrogen)
$n\text{-}C_4H_8 \longrightarrow C_4H_6 + H_2$
(normal butylene) ⟶ (butadiene + hydrogen)

The above reactions occur to an appreciable extent only at temperatures above 900°F.

Table I presents equilibrium values for mol. fraction of n-butane, butene-1, and butadiene 1, 3 as calculated from thermodynamic considerations by Gruse and Stevens (6).

Table II lists equilibrium olefin concentrations as calculated from data of Gruse and Stevens (6), Kassel, and Pitzer. The work of the latter authors on this subject is summarized by Grosse and Ipatieff (4). While the absolute values of equilibrium constants are at variance, the magnitude of per-pass conversions is indicated.

Description of the Houdry Adiabatic Dehydrogenation Process

Dehydrogenation is accomplished by passing the preheated hydrocarbon vapors under controlled conditions of space velocity, temperature, and pressure over catalysts of the chromic oxide (Cr_2O_3) alumina type. A study of their catalytic behavior as related to their physical and chemical characteristics has resulted in the preparation of materials of controlled and highly selective activity suitable for various dehy-

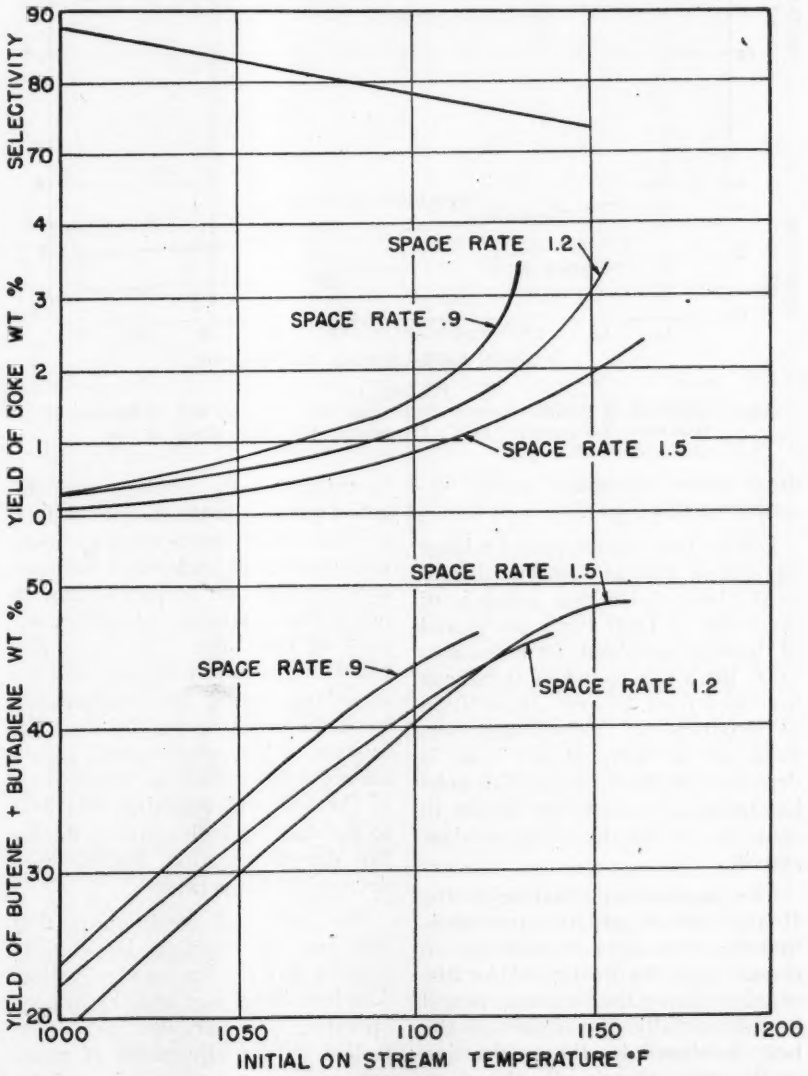


FIGURE I
Dehydrogenation of N-Butane, Adiabatic Unit, 7" HG ABS. Pressure Effect of Temperature

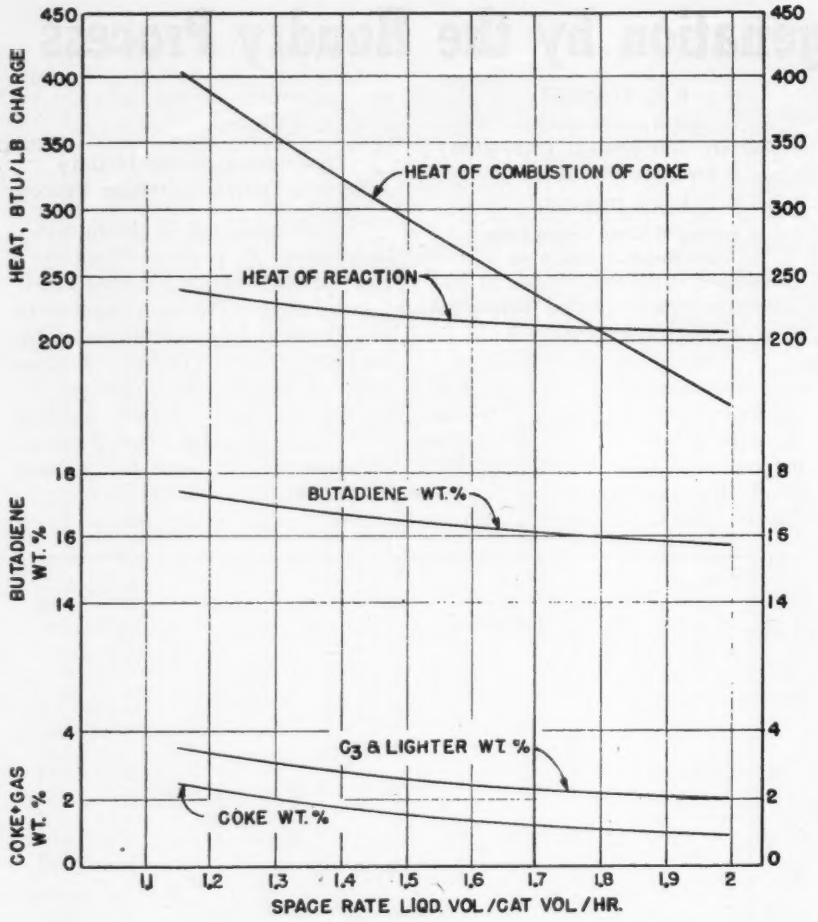


FIGURE II
Dehydrogenation of Butane—Butene Isothermal Unit: Charge 65% N-Butene, 35% N-Butane; Temperature 1100°; Pressure 5 HG. ABS.; Effect of rate.

drogenation charging stocks described in this paper.

During the reaction period a large amount of heat is absorbed due to to the heat of reaction which is of the order of 1,000 Btu's per pound of butene produced from butane, 2,000 Btu's per pound of butadiene produced from butane. In addition to products of dehydrogenation, fixed gas is liberated and coke is deposited on the catalyst. This coke has to be burned off periodically in order to restore the initial catalyst activity.

The characteristic feature of the Houdry dehydrogenation process is that the operating conditions are so chosen that the heat used for the reaction during the onstream period is substantially the same as the heat developed by the combustion of the coke deposit. Furthermore, the heat capacity of the catalyst bed is controlled by mixing with the active catalyst in the form of pellets, a catalytically inert material. Several sources of such inert material are available, but secrecy orders do not permit disclosure of further details at this time. The inert material acts as a heat storage medium absorbing during the regeneration cycle the heat liberated by the combustion of the coke deposit, with a consequent increase in temperature of the bed, and releasing that heat to the reacting hydrocarbons during the dehydrogenation period, with decreasing temperature.

The preferred condition is that the heat of reaction be slightly greater than the heat of combustion. The heat deficiency and the desired operating temperature are controlled by the adjustment of reactant and air temperatures, and by the use in the regeneration cycle of an amount of air substantially greater than the combustion requirements. The latter equalizes differences in temperature in a large size bed due to heat losses in parts adjacent to the wall, imperfect flow distribution of fluids throughout the bed, minor inequalities in catalyst activities and heat capacities, and the like. The air used being near atmospheric pressure, the cost of pumping is nominal and the heat can be recovered in waste heat boilers.

The inert material possesses a very large surface and the heat exchange between this material, the catalyst pellets, and the reactants takes place with very small temperature differences.

The on-stream periods are kept very short, namely, between 7 and 15 minutes. By this means the temperature variation during the cycle is small, usually within 50° F. covering the optimum range of temperature necessary to insure high conversions; also the total coke deposit on the catalyst is limited to a low value, insuring high catalyst activity throughout the cycle.

The advantages derived from the use of this scheme are as follows:

1. Expensive special alloy heat exchange equipment within the reactor is eliminated and the reactor construction is cheap.
2. Reactants are introduced at substantially reaction temperature, eliminating problems of prethermal cracking.
3. The temperatures are controlled within the desired range of reaction. No excessive temperatures are encountered during the regeneration period, thus protecting catalyst life.
4. Regeneration can be accomplished by the use of fresh air, with no limitation of oxygen concentration, and there is no problem of recirculating hot gases.
5. High conversion per pass and high product concentration are feasible.

Extensive laboratory and pilot plant experimentation as well as continuous commercial operation have proved the practicability of this unique development.

Discussion of Laboratory Data on the Effect of Variables in the Dehydrogenation of Butane and Butane-Butene Cuts

Temperature

Dehydrogenation equilibria referred to previously indicate that high temperatures are required for conversions of commercial interest. These equilibria are such that mono-olefins can be produced economically at substantially atmospheric pressure and temperatures of the order of 1050—1100° F. For the production of di-olefins, however not only high temperatures but also low partial pressures are necessary. These can be attained by either diluting the reactants with some inert gas or vapor or operating at low absolute pressures. Considerations of cost usually preclude the use of gases. Steam has been found to be detrimental to the reaction, as well as to catalyst life. Operating at reduced pressures as low as 2½ pounds absolute has been found practical for the production of di-olefins and the engineering problems connected with this type of operation have been readily solved.

Figure I shows the effect of temperature at various space rates on the dehydrogenation of butane. These data were obtained during the study of butadiene production and were, therefore, obtained at reduced pressure. Of interest is the rapid increase of yield with temperature, the decrease in selectivity, and the rapid increase in coke formation above 1100° F.

Space Rate

Space rate can be varied quite widely without substantially affecting the yield of products. The side reactions, particularly the coke formation, are cut considerably by increased space rates and this factor is the most effective way to balance out heat of reaction with heat of carbon combustion.

Figure II shows the yield of butadiene from a charging stock containing 35% n-butene and 65% butane at constant pressure, constant temperature, and varying space rate.

The upper curves show the calculated heat of reaction and heat of combustion, respectively. The point at which the curves cross is the point of operation at "adiabatic condition".

These data were obtained in a laboratory isothermal unit.

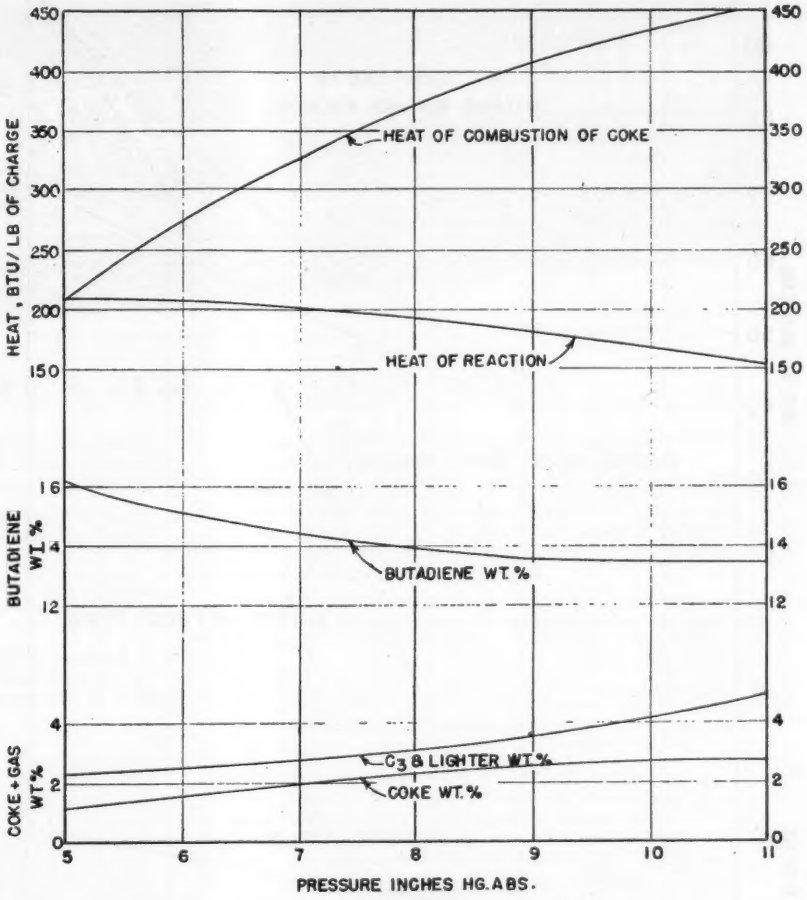


FIGURE III

Dehydrogenation of Butane-Butene Isothermal Unit, Charge 65% N-Butene, 35% N-Butane, Temp. 1100°, Space Rate 1.8 Vol/Vol/ Hr., Effect of Pressure.

Pressure

Within the range of pressures necessary to effect the desired reaction an adjustment in pressure also provides means of controlling the coke deposit in relation to the heat of reaction.

Figure III shows the effect of varying pressure at constant temperature and space rate on same charging stock as above, i.e. 35% n-butene and 65% n-butane.

Again it can be seen that the curves showing heat of reaction and heat of combustion cross at the operating point for the chosen space rate and temperature.

Feed Composition

Figure IV shows the relationship between butane in original fresh feed, butene in composite feed to reactor, butene in recycle stock, and butadiene in reactor product.

It shows the yields of products from once-through operation (lower scale) and the yield and product distribution in recycling operations.

For example, starting with n-butane (0% butene in fresh feed), the reactor charge builds up to approximately 44% butene and the yield of butadiene per pass is 12.5%.

Catalyst Activity

From the above considerations, it is evident that the catalyst must possess enough activity to give good conversion with a controlled coke deposit. Also, the activity must be oriented towards the maximum conversion of butane resulting in higher butene concentration in reactor charge and subsequently higher conversions to butadiene per pass.

Figure V shows the effect of catalyst heat treatment on butadiene

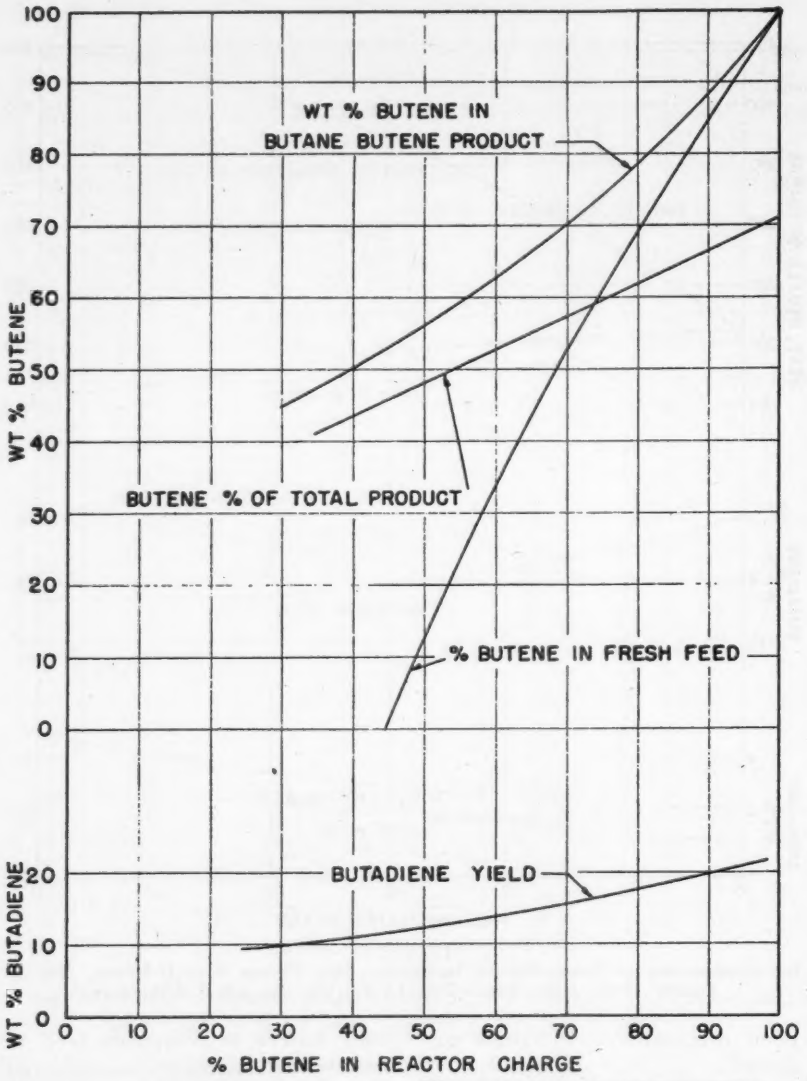


FIGURE IV

Dehydrogenation of N-Butane, N-Butene, Temperature 1100°, Space Rate 1, 5 HG ABS. Pressure, Adiabatic Unit. Effect of Feed Composition.

and coke yield for a given concentration of chromic oxide on the alumina support and the effect of varying this concentration on conversions of butane and butene, respectively.

Description of Commercial Units

Figure VI is a simplified flow chart of the single-stage unit.

The normal butane is preheated in a furnace along with the unconverted butane-butene cut recycled from the extraction unit. The catalytic battery comprises 6 reactors, although it could be built with 3 reactors of same total capacity.

After passing through the catalyst bed, the hydrocarbons are cooled by direct spraying with oil, compressed and sent to a vapor recovery system of conventional design where a cut of butadiene-butene-butane is obtained. Butadiene is extracted and purified by solvent or a combination distillation-solvent extraction, the remaining B-B cut returned to the process as recycle stock.

After the on-stream period, air is introduced to burn off the coke deposit. This air is preheated by direct combustion of fuel in the stream, and the pressure at the blower discharge is controlled by the pressure drop through the system which is generally of the order of 2-3 pounds per square inch.

At the end of the regeneration period, the air remaining in the reactor is evacuated by a steam jet, prior to introduction of hydrocarbons for another on-stream period.

Motor operated valves are operated through a cycle timer similar to the type used in a large number of Houdry catalytic cracking units. Proper interlocks insure that a valve cannot be opened unless the necessary valves have been previously closed, precluding mixing of various streams.

As a further precaution against mixing of streams through valve leakage, inert gas is automatically admitted in the bonnets and lantern

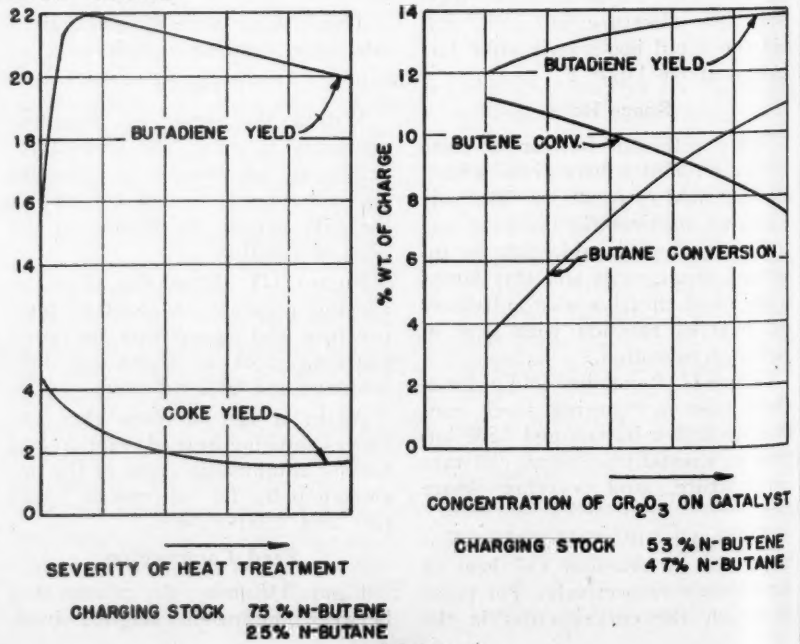


FIGURE V

Effect of Catalyst Activity.

NATIONAL IDEAL ROTARY MACHINES

Famous for Many Deep and High Speed Drilling Records!

HERE ARE A FEW REASONS WHY:

SPIRAL BEVEL GEARS—Perfectly matched sets manufactured in our own factory from Ideal Electric Steel. Shock-resistant, spiral-cut teeth assure a smoother and quieter running machine.

FULLY ENCLOSED—Complete enclosure of these rotary machines permits proper lubrication without contamination by foreign matter.

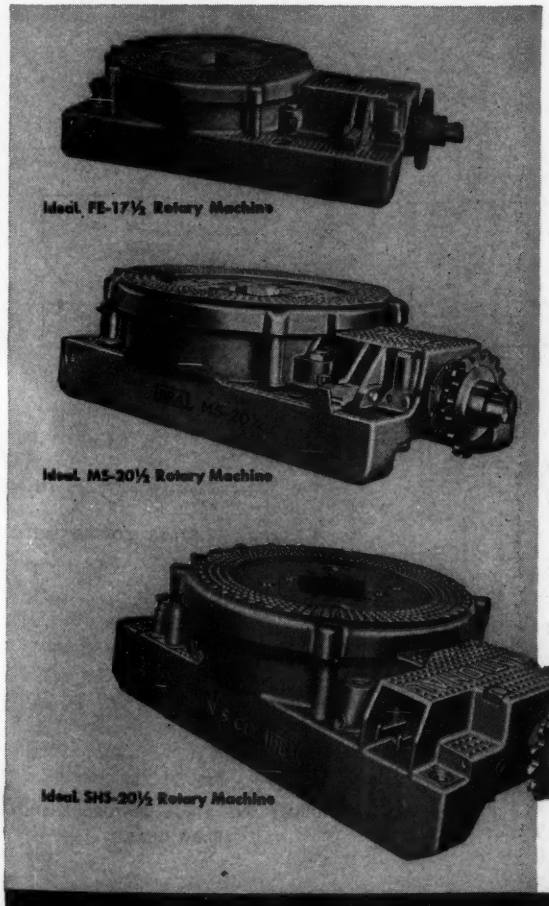
PROVEN MAIN BEARING—Especially designed for high rotating speeds and heavy loads. Precision ground races are heat treated to obtain uniform hardness.

IMPROVED PINION SHAFT ASSEMBLY—Pinion shaft is mounted on a pair of roller bearings supported in individual housings secured to the under side of the base. The entire unit may be easily removed and all elements on the pinion shaft are removable over the sprocket end.

SPECIAL MUD AND OIL SEALS—A double tongue-and-groove labyrinth between table and base prevents entrance of mud or escape of oil. Special labyrinths are provided between the pinion shaft outer bearing housing and shaft to prevent the entrance of mud into the bearing.

IMPROVED TABLE GUARD—An original National design having a wide non-skid tread top with openings around the outer edge to provide a means of flushing down side of base. The side of the guard opposite the sprocket is designed as a foot rest. Guard is supported on the base by four legs, eliminating the use of supporting lugs on the side of the base and enabling it to be quickly removed. It extends above the table top, thereby deflecting all mud that is thrown off during rotation.

OIL BATH LUBRICATION—Positive oil bath lubrication, induced by rotation of the table, is provided for all main bearings and gears of Ideal rotary machines. This lubrication system is continuous in action, being devised in accordance with laws of rotation in contrast to many systems that require the lubricant to enter the main bearing against the centrifugal force induced by rotation.



Ideal FE-17½ Rotary Machine

Ideal MS-20½ Rotary Machine

Ideal SHS-20½ Rotary Machine

TYPES

FE-12½—A light weight machine for shallow and "Slim Hole" drilling at average drilling speeds. Made with either 36" or 44" spacing between sprocket and table center.

FE-17½—For shallow to medium depth drilling at moderate speeds. The FE-17½ is made with either 44" or 53¼" spacing.

MS-20½—For deep drilling at medium high speeds.

SHS-20½—For the highest attainable drilling speeds and deepest drilling. The SHS-20½ is National's popular machine for superior high speed performance.

ARMY E NAVY

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Executive Offices: Pittsburgh, Pa.

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rings provided in the packings when valves are closed.

The flow of reactants and air is continuous; two reactors of the battery receiving hydrocarbons while two are receiving air, and the last two being under valve change or purging operation.

Heat can be recovered from the cooling oil by heat exchange with the furnace feed and from the air stream in waste heat boilers.

A very satisfactory two-stage operation has also been developed. Secrecy restrictions imposed by government agencies preclude discussion of the details of operation at the present time.

Commercial operation of the Houdry adiabatic catalytic dehydrogenation process is carried on by the Sun Oil Company at their Toledo refinery and the Standard Oil Company of California at their El Segundo refinery. Both of these facilities were built by Defense Plant Corporation, and are operated by the respective oil companies for the account of the Rubber Reserve Company. Butadiene production from the Toledo plant is utilized in the production of GR-S rubber at the copolymerization plants of Firestone and Goodyear at Akron; butadiene from the El Segundo installation is utilized at the U. S. Rubber and Goodyear plants at Torrance, California. One of these plants operates in the single-stage cycle as described above. The other plant is equipped to operate either single or two-stage.

Table III gives a comparison of typical pilot plant, semi-commercial plant, and commercial plant operating conditions and yields.

Commercial results are in general agreement with the correlation of Figure IV, with certain deviations as regards butene concentration in the reactor charge, although butadiene yields per pass predicted in the correlation are obtained.

Application of the Process to Production of Mono-olefins

For the production of butenes from the corresponding normal and isobutane, the reaction is conducted at atmospheric or slight positive pressures and the space rate adjusted to balance the coke formation with the necessary heat of reaction.

Laboratory and semi-commercial operations have indicated the possibility of obtaining up to 50% conversion with selectivities of the order of 70 to 75%.

The plant flow sheet is substantially the same as the one-stage unit. Line sizes and compression recovery facilities are smaller than with vacuum operation.

If it is desired to produce both butadiene and butenes, the process can be operated under reduced pressure. In this case it is more practical to balance the heat requirements by supplementing the normal coke production. This can be accomplished by passing on the catalyst a nominal amount of an extraneous material heavier in boiling range than the charge, after the dehydrogenation period

Propane and ethane can be dehydrogenated to their corresponding mono-olefins. The equilibrium

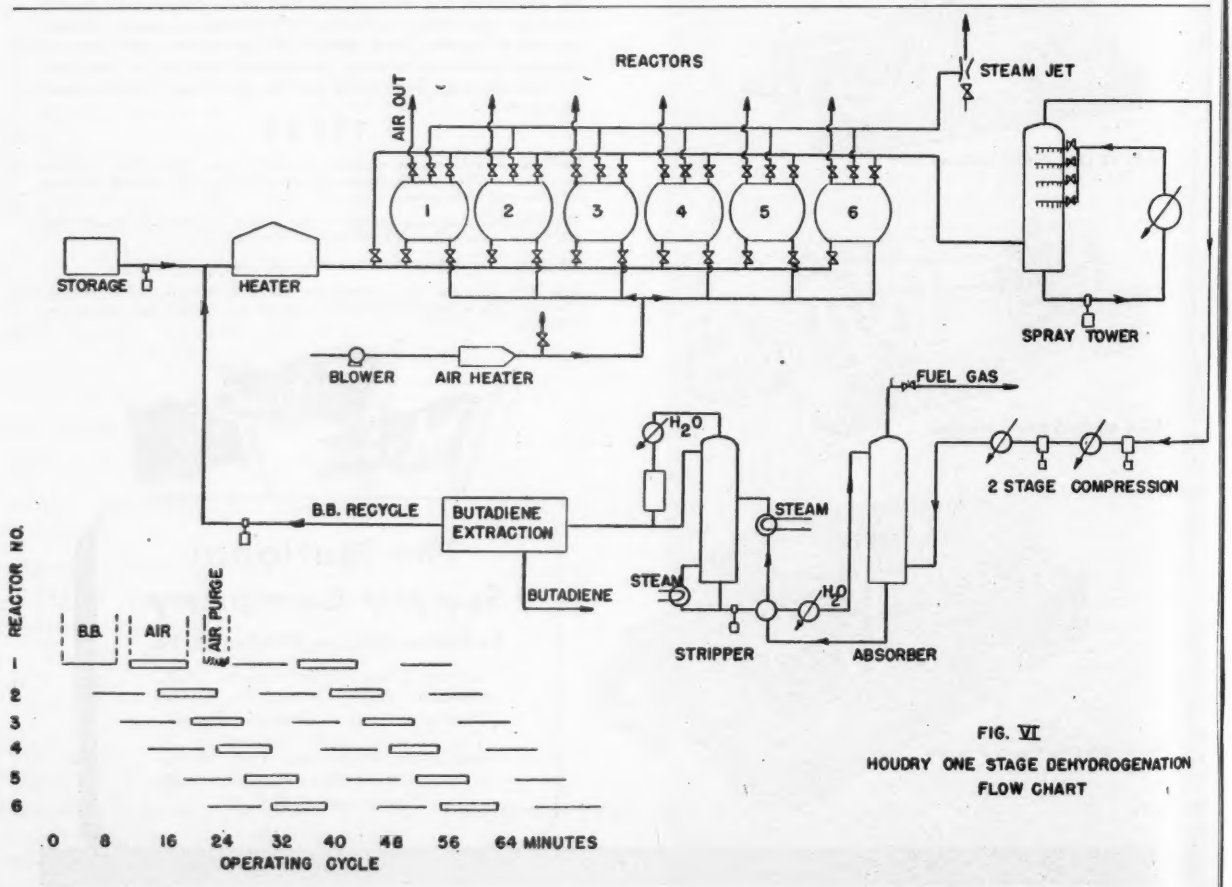
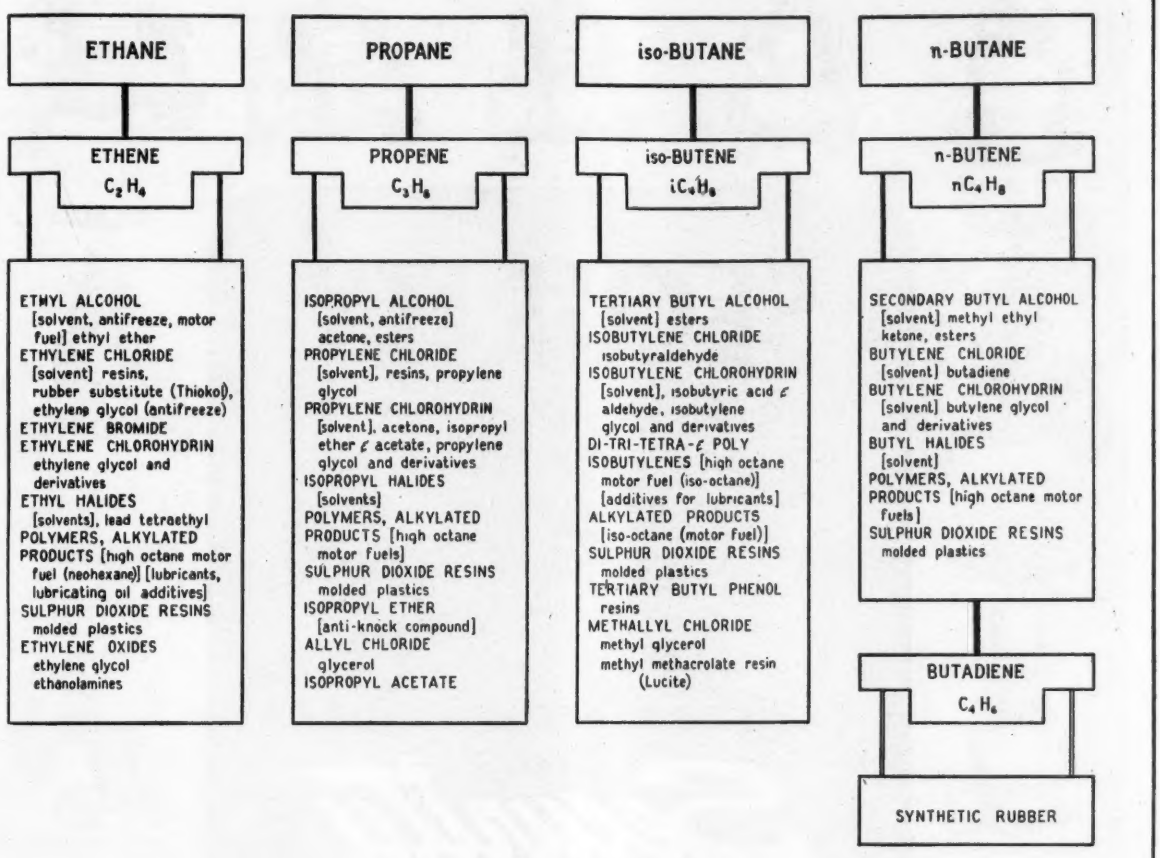


FIG. VI
HOUDRY ONE STAGE DEHYDROGENATION FLOW CHART

FIGURE VII
PRODUCTS OBTAINABLE FROM NATURAL GAS HYDROCARBONS


ETHANE
ETHENE
C_2H_4
ETHYL ALCOHOL [solvent, antifreeze, motor fuel] ethyl ether
ETHYLENE CHLORIDE [solvent] resins, rubber substitute (Thiokol), ethylene glycol (antifreeze)
ETHYLENE BROMIDE
ETHYLENE CHLOROHYDRIN ethylene glycol and derivatives
ETHYL HALIDES [solvents], lead tetraethyl
POLYMERS, ALKYLATED PRODUCTS [high octane motor fuel (neohexane)] [lubricants, lubricating oil additives]
SULPHUR DIOXIDE RESINS molded plastics
ETHYLENE OXIDES ethylene glycol ethanolamines
PROPANE
PROPENE
C_3H_6
ISOPROPYL ALCOHOL [solvent, antifreeze] acetone, esters
PROPYLENE CHLORIDE [solvent], resins, propylene glycol
PROPYLENE CHLOROHYDRIN [solvent], acetone, isopropyl ether & acetate, propylene glycol and derivatives
ISOPROPYL HALIDES [solvents]
POLYMERS, ALKYLATED PRODUCTS [high octane motor fuels]
SULPHUR DIOXIDE RESINS molded plastics
ISOPROPYL ETHER [anti-knock compound]
ALLYL CHLORIDE glycerol
ISOPROPYL ACETATE
iso-BUTANE
iso-BUTENE
iC_4H_8
TERTIARY BUTYL ALCOHOL [solvent] esters
ISOBUTYLENE CHLORIDE isobutyraldehyde
ISOBUTYLENE CHLOROHYDRIN [solvent], isobutyric acid & aldehyde, isobutylene glycol and derivatives
DI-TRI-TETRA-& POLY ISOBUTYLENES [high octane motor fuel (iso-octane)] [additives for lubricants]
ALKYLATED PRODUCTS [iso-octane (motor fuel)]
SULPHUR DIOXIDE RESINS molded plastics
TERTIARY BUTYL PHENOL resins
METHALLYL CHLORIDE methyl glycerol
methyl methacrolate resin (Lucite)
n-BUTANE
n-BUTENE
nC_4H_8
SECONDARY BUTYL ALCOHOL [solvent] methyl ethyl ketone, esters
BUTYLENE CHLORIDE [solvent] butadiene
BUTYLENE CHLOROHYDRIN [solvent] butylene glycol and derivatives
BUTYL HALIDES [solvent]
POLYMERS, ALKYLATED PRODUCTS [high octane motor fuels]
SULPHUR DIOXIDE RESINS molded plastics
BUTADIENE
C_4H_6
SYNTHETIC RUBBER

concentrations in the same temperature region are lower than for the dehydrogenation of butane. Consequently, the yields per pass are correspondingly lower, of the order of 30% for propene and 16-20% for ethylene. The selectivities are high and the coke formation low at atmospheric pressure, and means of supplementing the coke formation as described above are used.

In order to obtain ultimate yields, it is necessary to provide means for selectively removing the ethylene or propylene, as the case may be, from the reactor effluent after quenching and recovery by compression and/or absorption. As is well-known, the ethylene can be removed by sulfuric acid and synthetic ethyl alcohol produced by hydrolsis. Propylene can be similarly removed to form iso-propyl alcohol on subsequent hydrolysis. It is therefore seen that a whole field of potential chemical industries is opened up by catalytic dehydrogenation of the relatively inert paraffin constituents of natural gas and gasoline to olefins or di-olefins, which can be reacted in a number of ways to produce a large number of products. Figure VII, from Bureau of Mines Information Circular 7108, diagrammatically shows a few of the intermediate and chemicals which can be produced from paraffinic hydrocarbons through the initial step of dehydrogenation.

Other Applications of the Process

Among the other products which have received attention in laboratory scale experimentation are:

Isoprene from dehydrogenation of isopentane.

Styrene from ethyl benzene.

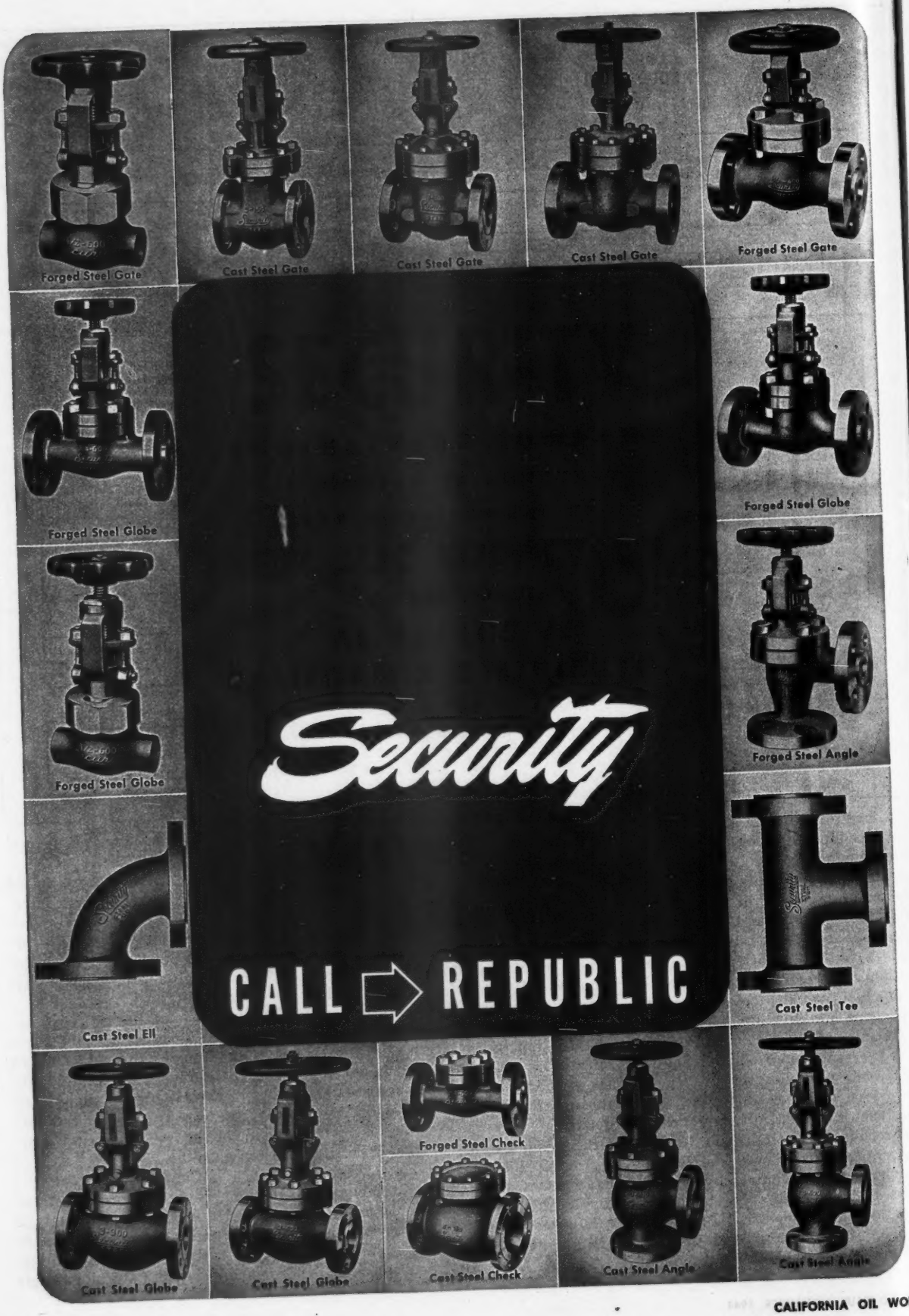
Methyl styrene from isopropyl benzene.

These reactions, not being limited by the low equilibrium concentration of the lower olefins, take place readily in the range of 1,000-1,050° F., and yields per pass of the order of 45% styrene and 60-65% methyl styrene are obtained.

The principle of storing regeneration heat in an inert high heat capacity medium in the catalyst bed has still another interesting application in the Houdry adiabatic catalytic cracking process for the conversion of heavy petroleum fractions to gasoline.

Conclusion

In conclusion, it may be stated that the Houdry adiabatic catalytic dehydrogenation process has made available to the petroleum refining, petrochemical and natural gasoline


Forged Steel Gate
Cast Steel Gate
Cast Steel Gate
Cast Steel Gate
Forged Steel Gate
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Forged Steel Globe
Forged Steel Angle
Security
CALL REPUBLIC
Cast Steel Ell
Cast Steel Tee
Cast Steel Globe
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Forged Steel Check
Cast Steel Check
Cast Steel Angle
Cast Steel Angle

TABLE I
N-BUTANE DEHYDROGENATION EQUILIBRIUM*
Equilibrium Mol Fraction

Temperature			n-Butane		butens-1		butadiene-1, 3		hydrogen	
K	C	F	1 atm.	0.25 atm.	1 atm.	0.25 atm.	1 atm.	0.25 atm.	1 atm.	0.25 atm.
600	327	621	.97	.96	.015	.02	....	...	.015	.02
700	427	801	.72	.58	.14	.20	....	.01	.14	.21
800	527	981	.42	.20†	.27	.34	.01	.04	.30	.42
900	627	1,161	.20	.02	.29	.30	.07	.13	.44	.55
1,000	727	1,341	.01	.01	.22	.09	.18	.27	.59	.63

*"Rounded off" values from Gruse and Stevens.
†Adjusted.

industries a means for converting paraffins from ethane through pentane to olefins and di-olefins. Other dehydrogenation reactions of commercial interest can be handled by the process. Commercial operation of the Houdry adiabatic dehydrogenation process for the production of butadiene proves the feasibility of the process. Large potentialities for production of chemicals from petroleum are opened up, and it is therefore expected that the process will find application in postwar dehydrogenation projects.

Acknowledgment

The authors wish to express their appreciation of helpful suggestions made during early pilot plant and semi-plant studies by the technicians of the following companies:

Socony-Vacuum Oil Company, Incorporated.

Standard Oil Company of California.

Standard Oil Company of Indiana.

Sun Oil Company.

Permission of the Sun Oil Company to use commercial plant data is acknowledged.

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TABLE II
COMPARISON OF CALCULATED EQUILIBRIUM
OLEFIN CONCENTRATIONS IN BUTANE DEHYDRATION
AT ATMOSPHERE PRESSURE
Equilibrium Olefin Concentration (Mol %)

Temperature					
°K	°C	°F	Gruse and Stevens*	Kassel†‡	Pitzer†‡
700	427	801	14	8.3	11.4
773	500	932	25	20.6	24.5
873	600	1.112	34	40.3	41.9
1,000	727	1,341	40	48.7	48.7

*Includes butane and butadiene.
†Butene only.
‡Reported by Grosse and Ipatieff.

TABLE III
COMPARISON OF LABORATORY, SEMI-COMMERCIAL
AND COMMERCIAL UNITS
HOUDRY SINGLE-STAGE BUTADIENE PROCESS

Unit	Pilot Plant		Semi-Commercial		Commercial	
Catalyst Capacity, cu. ft.	0.35		11.7		1,060	
Number Cases	1		1		6	
Operating Conditions						
Cat. Temp., on-stream, °F. ave.	1,060		1,124		1,100	
Cat. Temp., off-stream, °F. ave.	.....		1,083		.....	
Cat. Temp., °F. ave.	.....		1,103		1,070	
Pressure, inches Hg Abs.	5.0		4.9		4.9	
Time on-stream, Mins.	10.0		7		10	
Charge Temperature, °F.	.....		1,085		1,075	
Regeneration Air Temp., °F.	.....		1,140		1,075	
Charge Rate, V/V/Hr.	1.9		2.8		2.7	
Regeneration Air Rate, CFM/Liter	0.5		1.8		2.2	
Yields, % Wt.	**Chg.**	**Prod.**	**Chg.**	**Prod.**	**Chg.**	**Prod.**
C_3 and Lighter	.....	1.6	4.6	7.8	2.2	3.7
Isobutane	2.5	3.7	3.1	1.6	0.9	1.9
Isobutene	.....	3.5	1.5	2.3	2.1	2.5
n-Butene	26.8	36.8	28.9	26.9	23.1	23.1
n-Butane	70.5	42.9	62.7	46.3	67.0	53.3
Butadiene	0.2	10.1	.....	11.8	3.8	12.7
C_5 Plus	.....	0.4	.....	0.8	0.9	1.7
Coke	.....	1.0	.....	2.5	.....	1.2
	100.0	100.0	100.0	100.0	100.0	100.0

U. S. Bur. of Mines to Study Synthetic Liquid Fuels

The U. S. Bureau of Mines has announced the establishment of an Office of Synthetic Fuels to supervise a 5-year program to study ways and means of making oil and gasoline from coal, shale, farm products and forest products. Dr. W. C. Schroeder has been appointed Acting Chief.

BUY WAR BONDS

Cycling Plant Recovers Oil Carried by CO_2

In the McCallum oil field near Walden, Colorado, the Continental Oil Company is building the first unit of a cycling plant to recover oil carried by high-pressure carbon dioxide gas. No natural gas is associated with the oil.

The cycling unit is designed to handle 32,000 MCF of CO_2 daily and recover 700-800 bbl. of oil. Five wells supply the gas. After the oil is extracted, the gas is to be returned underground to maintain the reservoir pressure.

A. I. M. M. E. Petroleum Division Holds Successful Los Angeles Meeting

On October 20 the Petroleum Division of the American Institute of Mining and Metallurgical Engineers held an all-day technical session at the Ambassador Hotel, followed by a dinner in the evening.

Miller on Synthetic Liquid Fuels

H. C. Miller of the U. S. Bureau of Mines discussed the government project for the construction and operation of demonstraction plants to produce synthetic liquid fuels from coal, oil shales, agriculture and forestry products, and other substances. This work has been authorized by Congress through the Synthetic Liquid Fuels Bill, S. 1243, introduced by Senator O'Mahoney of Wyoming.

The immediate program includes laboratory studies and demonstration plants for the direct hydrogenation of coal or lignite by some modification of the Bergius process, the indirect hydrogenation of coal or lignite by the gas synthesis (Fischer-Tropsch) process, and the distillation of oil shale.

In the Bergius process, powdered coal is made into a paste with a heavy oil and catalytically treated with hydrogen gas at 3,000-8,000 pound pressure and 800°-900° F. One to 1¼ tons of highly volatile bituminous coal yields about two barrels of 70-75 octane gasoline.

In the Fischer-Tropsch process, coal and steam react to form a mixture of carbon monoxide and hydrogen gases called "water gas". The water gas is catalytically treated at 15-150 pounds and 360°-410° F. Products obtained are low-octane gasoline, Diesel oil, liquefiable gases and wax.

Oil is recovered from oil shale by retorting, and by a hot water extraction process.

Olds, Sage and Lacey on P-V-T Relations in Paloma Field

The authors experimentally determined the volumetric properties of liquid and gas samples from the primary separator of a well in the Paloma Field, California, at 5,000 pounds pressure and temperatures of 100°, 190° and 250° F. The influence of pressure and temperature upon the composition and specific volume of the bubble point liquid and of the retrograde dew-point gas was established. The volumetric behavior of the mixture corresponding to that produced by the well at the time of sampling was determined at 235° F.

The effect of removing propane, iso and normal butane and specific amounts of isopentane was studied. When all of the isobutane and n-butane and substantially all of the isopentane were removed, the retrograde dew-point pressure at 235° F. increased 558 pounds. When all of the propane, isobutane, n-butane and substantially all of the isopentane were removed the retrograde dew-point pressure at 235° F. increased 1208 pounds.

Pease on Fluid Movement in Wells

An inexpensive and relatively rapid method was described for determining fluid movement in wells. A dye tracer is released in a well at a predetermined level and, after an interval of time, the well fluid is sampled at another level. The rate of movement can be calculated from time-volume relationships. The procedure is described as valuable when it is desirable to determine whether any point-to-point fluid transfer is occurring in a shut-in well, also the rate of movement.

Brilliant water-soluble aniline dyes are used in wells having an appreciable water cut. The water cut can be as low as 10 per cent and still yield dye detection. The use of a series of contrasting dyes for successive runs serves to identify each run and to eliminate confusion.

Babson, Sherborne and Jones on Water-Flooding in California

The paper discusses a small-scale project to determine whether water will displace oil from the Chapman Zone in the Richfield field. While it cannot be stated positively at this time that the water-flooding will be economically successful, it has been demonstrated that water can be injected into the zone on a sustained basis and that this water will displace appreciable quantities of oil from the sand.

Oil production from one well, since beginning water-injection, has risen from 7 to 30 bbls. per day. While the water cut has been rising quite rapidly, the well has produced almost 3,000 barrels of oil in addition to that which would normally have been produced.

The paper gives reservoir data, procedure for treating the flooding water, and details of the water-injection operations.

Valby on Tracing High Pressure Gas Migration

Oil fields having an area of gas cap, or light oil production, over the dark oil area presents a problem of increasing gas-oil ratios during the production of an oil well. The use of pressure maintenance in a field such as this, or a recycling project, wherein residue gas from an absorption plant is injected into the reservoir adds to the problem, because a part of the increased gas-oil ratio may be due to the production of injected gas.

The author presents a method in which the hydrocarbon weight fractional analysis of the well effluents from a true gas cap portion well and a true dark oil ring well furnish the basic data for determining the properties of any mixture of production from the two sources. The effect of injected gas on these properties can be computed.

The method is based on the principle that, if two fluids, or well effluents, having different properties are mixed in known proportions by weight, the properties of their mixtures can be computed. Conversely, if these base data are known, the properties of a mixed well effluent can be used to compute the relative amounts of each type of well effluent in the mixture. The development of equations is shown, and practical illustrations given.

Hassler and Brunner on Capillary Pressures in Core Samples

The importance of capillary phenomena in determining the behavior

of liquids in porous media (oil sands, etc.) has long been recognized. Progress in the application of capillary phenomena to the solution of problems of reservoir mechanics has not been more rapid due to the lack of a satisfactory technique for measuring the capillary pressures in reservoir rocks.

The paper describes a centrifuge method by which the relation between capillary pressure and saturation can be determined for small consolidated core samples which have been extracted and resaturated. While possessing some disadvantages, the method allows the capillary pressure curves of core samples quickly and conveniently to be determined and to be extended to rather large values of capillary pressure. Moreover, the method is not limited to use with a liquid and a gas as the fluids in the core. The capillary behavior of a core to oil and water may be measured directly.

Johnston and Beeson on Water Permeability of Reservoir Sands

For many years the permeability of reservoir sands has been measured by flowing air through a cleaned and dried core sample. This differs from the true reservoir permeability in this important respect: the rock particles in the reservoir are surrounded by interstitial water, not air, and their physical shape and condition of hydration are greatly dependent thereon.

Permeability as defined must be measured with a single-phase fluid. Since no means exist for removing the oil and gas from a core sample by simply flowing water through it, the sample must be cleaned and then re-saturated with water before testing. The authors show that after the cleaning process, a considerably different permeability is determined with salt or fresh water than is obtained with air. The postulate is made that the salt-water permeability is probably closer to the true reservoir permeability than is the measurement with air. This is discussed in relation to both physically possible and economically feasible measurements.

Data on over 1200 core samples are given to show the nature of the effects observed, and a plea is made for others to consider water permeability measurements as a routine necessity, eventually replacing air permeability in regions where the differences are great.

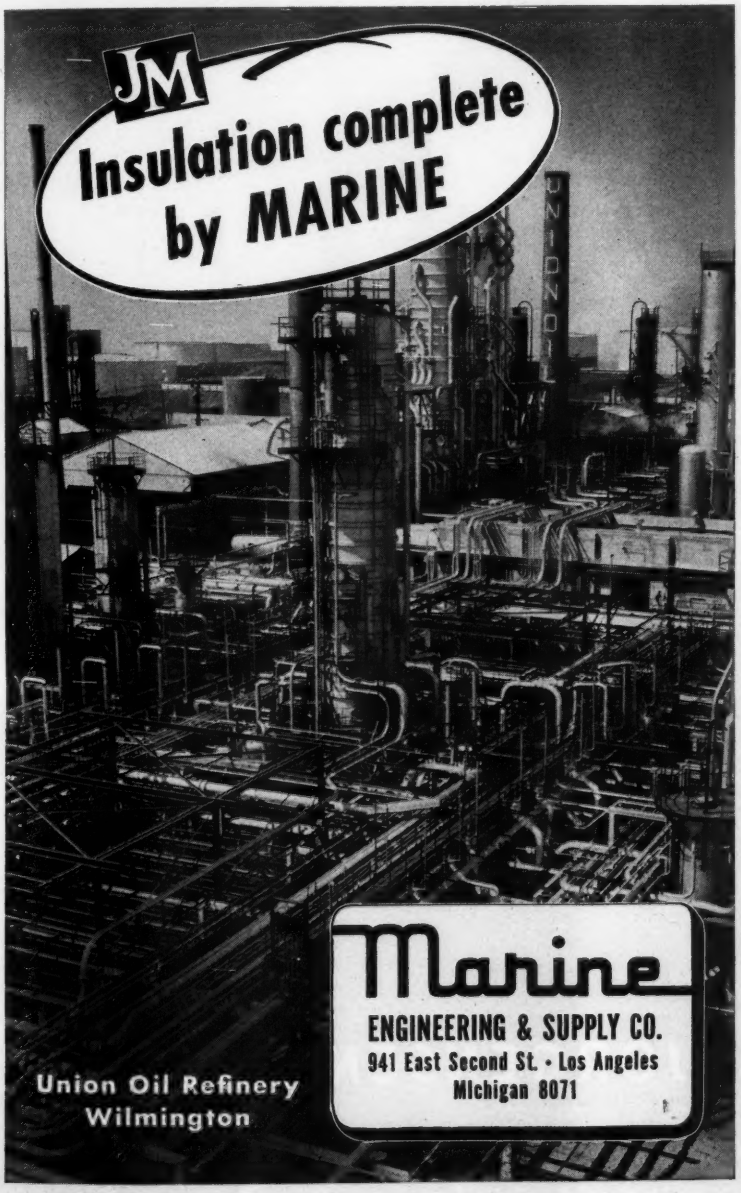
Cardwell and Parsons on Permeabilities of Oil Sands

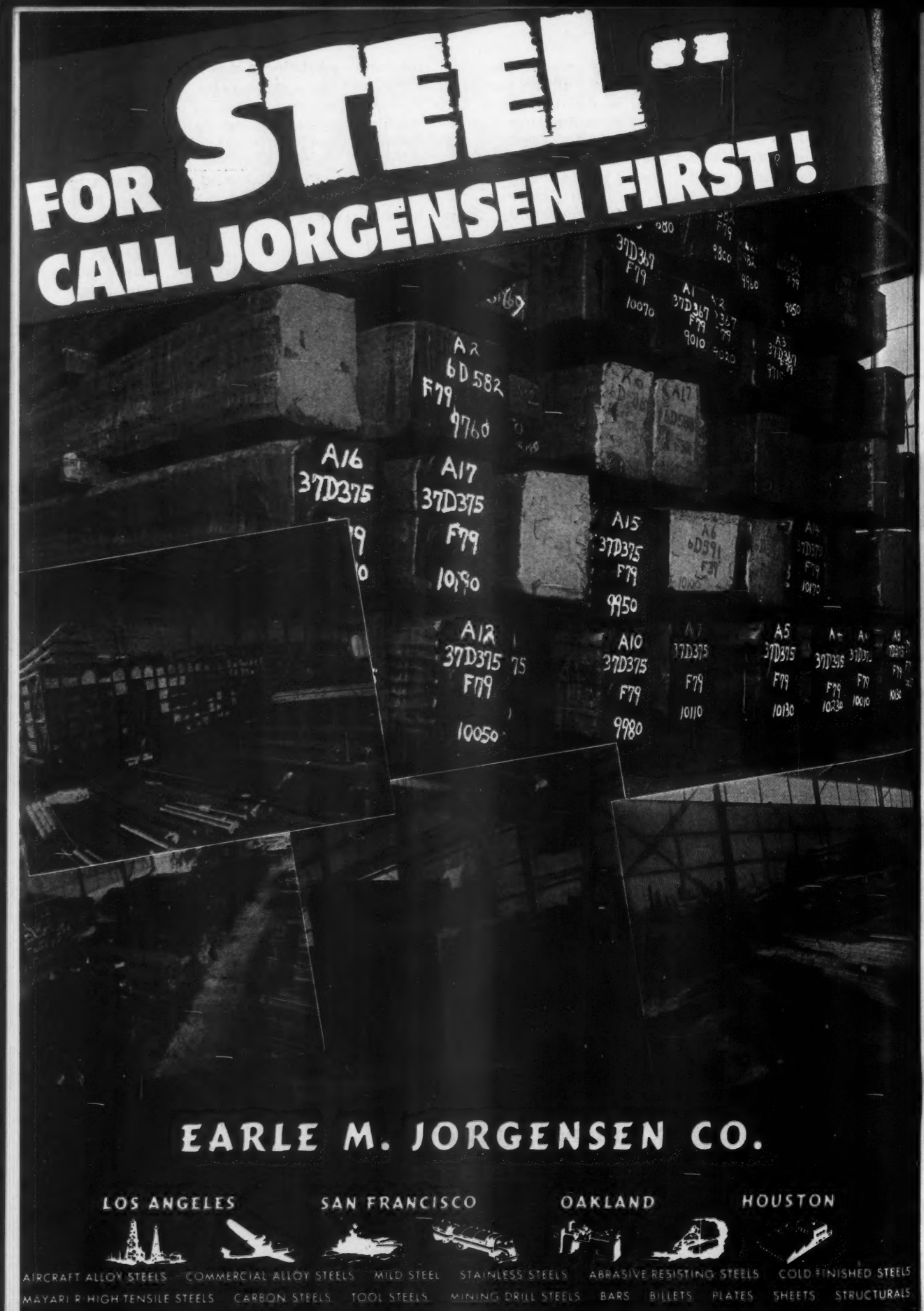
The authors discuss the practical problem of estimating a single equivalent permeability for an oil reservoir, or a portion thereof, whose actual permeability varies in an irregular manner. Limiting averages for general types of permeability variation are developed, and illustrated by examples involving important, specific types of variation.

For practical purposes, when the permeability variations away from a well are unknown, it is reasonable to assume that the equivalent permeability of a heterogeneous oil sand lies between the harmonic depth average and the arithmetic depth average of the core sample permeabilities.

Inventor of Ethyl Fluid Passes

Thomas Midgley, inventor of lead tetraethyl for depressing the knocking characteristics of gasoline, died November 2 at his home in Worthington, Ohio. He is credited with over 100 other chemical inventions and discoveries.

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Field Development

Los Angeles Basin

Huntington Beach Well Completed

Southwest Exploration Co. State J-27, an offshore well at 23rd & Ocean in the Huntington Beach field, completed at effective depth of 3890 ft., flowing 385 B/D. Settled production is 237 bbls. daily clean 20 gravity oil through an 18/64 inch bean. In the townlot area of the field, Boe Tunstall Co. Hume No. 4 at 22nd and Magnolia Avenue, is cleaning out to redrill from the 4150 ft. level. Also in the townlot area, C. S. Smith is rigging cable tools to redrill his No. 17 well. At the westerly end of the field, near the intersection of Hampshire St. and Pacific Coast Hiway, Hampshire Oil Co.'s prospect No. 1 is fishing drill pipe after reaching 1457 ft. where the pipe stuck and parted while attempting to pull.

Signal Hill Deep Test Delayed

The difficulties which have dogged Shell Oil Co.'s attempt to drill a deep test at 20th & Obispo Avenue in the Long Beach field continue with the company's current Alamitos No. 48-A. This well is fishing drill pipe at 4038 ft. and has discovered the 13⅜ inch casing to be parted at 3525 ft. At the southerly flank of the field the company is rigging up for a 10,000 ft. test of the Stakemiller lease.

Seal Beach Well Completed

Tide Water Associated Oil Co. Bryant No. 2-23 is completed at 7750 ft. flowing a settled 430 B/D 32.4 gravity clean oil and a half million cubic feet of gas under control of a 6/64 inch bean. The company is rigging up for an immediate start on Bryant No. 15. At the northerly end of the field, Standard Oil is testing its San Gabriel-Alamitos No. 1 at 4585 ft. and has rig up for No. 2 on the same lease and No. 30 on the San Gabriel lease. Most northerly of the extension wells is Shell Oil Co.'s Bryant 2-1 which was reported drilling at 7490 ft.

Lapworth Area Well Blows Gas

Hilo Oil Co. Bishop-Hilo-Lapworth No. 1, on sec. 4-2s-11w east of the Montebello field is drilling ahead in hard conglomerate at 3250 ft. after a formation test of silty sand showing cuts in the interval 2830-2975 ft. blew a strong rate of gas and recovered some gas cut oil spotted mud. The company is working on the basis of a fault accumulation and has tentative plans for two additional wells.

Costa Mesa Well Starting

Macoil Co. has poured foundation for its Townsend No. 3 near the corner of 17th & Whittier Sts. in the Costa Mesa area of Orange County. This well seeks production indicated by showings in earlier wildcats of the general area. To the south, in the Newport Beach field, the company's Old Banning-Townsend No. 1 recently cleaned out and conventional gravel packed and is making an average 50 bbls. per day of clean oil. The company is under way in a similar remedial job on old Banning-Townsend No. 2.

LOS ANGELES BASIN WILDCATS

Area	Well	No.	Section	Depth	Status
Aliso Canyon	Standard Oil Co., Del Aliso	1	29, 3-16	9156	Drilling
	Standard Oil Co., Frew	1-3	29, 3-16	5501	Drilling
	Standard Oil Co., Ward	3-1	27, 3-16	6817	Drilling
Calabasas	Simons, A. B., Well	1	22, 1-17		Rig
Castaic	Charter Oil Co., Well	1	18, 5-16		Graded roads
Chatsworth	Shell Oil Co., Schonfeld	1	30, 2-16		Rig
Hasley Canyon	Shell Oil Co., Claiborne	88-4	4, 4-17	4015	Pumping
Las Llajas	Standard Oil Co., Brady Est.	2-1	13, 3-17	2569	Redrilling
Montebello	Hilo Oil Co., Lapworth	1	4, 2-11	3250	Drilling
Newhall	Anderson, J. I., Tomato Can	1	11, 3-16		Prep. to spud
	British-Am. & The Texas Co., NLF	1	21, 4-17	7699	Drilling
	Standard Oil Co., N. L. & F.	3-2	19, 4-17	4475	Drilling
No. Covina	The Texas Co., Covina	27-1	7, 1-9	1875	Drilling
Pico Canyon	Standard Oil Co., Pico C. O.	42	1, 3-17	4794	Drilling
Pomona	Jones, Everett, Well	1	17, 2-9	327	Idle
Puente	Alleghany Pet. Co., Rowland	1	14, 2-10	1186	Prep. to pump
	Hacienda Oil Co., Well	1	27, 2-10		Location
	Hansen, Melvin, Corehole	3	24, 2-10	1900	Idle
San Jose Hills	Ohio Oil Co., Legrand	1	30, 1-9		Rigged up
	The Texas Co., Garnier	1	35, 1-10	1964	Drilling
Rosecrans	Wilshire Oil Co., Central Heights	1	28, 3-13	5739	Fishing D.P.
Whittier	Mayo Oil Co., Grey	1	17, 2-11	4974	Pumping
	Imperial County				
Brawley	Amerada Pet. Corp., Veysey	1	9, 13-13		Rig
	Orange County				
Brea Canyon	Selbar Oil Co., Wardman-Comm.	1	3, 3-10		Rig
Buena Park	Gen. Pet. Corp., Heath	2	34, 3-11	8935	Redrilling
	The Texas Co., Stern	1	1, 4-11	6080	Drilling
Costa Mesa	Macoil Co., Townsend	3	21, 6-10		Foundation
Kraemer	Mid. Cal. Pet. Co., Mid. Pet.	K-1	24, 3-9	2306	Drilling
	San Bernardino County				
Chino Hills	Chino Hills Oil Co., Kraemer	2	33, 3-28	972	Cleaning out

3 Minutes on Bottom

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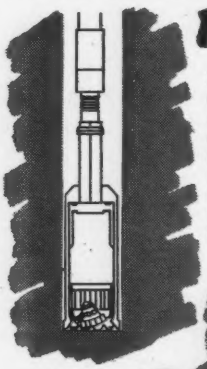

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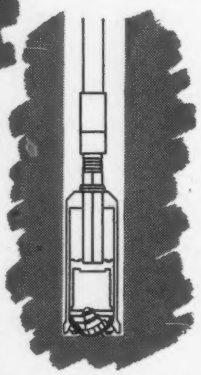
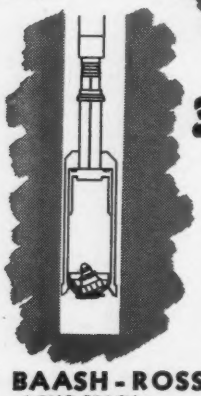


FINGERS MAKE BASKET **2**

Weight applied to the drill string drives the steel fingers through the die, bending them into a tight basket.



3 ON THE WAY UP!

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Covina Area Becomes Active

The Texas Co. has two strings under way in the Covina-San Jose Hills area of Los Angeles County. Garnier No. 1, sec. 35-1s-10w, is spot coring at 1964 ft. while Covina No. 27-1, on sec. 7-1s-9w, is drilling hard shale at 1875 ft. Both wells are too shallow for present index of the possibilities. On sec. 30-1s-9w, Ohio Oil Co's. Legrand No. 1 is rigged up to spud and is temporarily delayed while rebuilding roads washed out in the last storm.

Hasley Canyon Well Bailing

Shell Oil Co.'s Claiborne No. 88-4, on sec.. 4-4n-17w in Hasley Canyon area of Los Angeles County, is again bailing in an attempt to clear up a bad sand condition. Completed at redrilled depth of 4015 ft. the well went on the pump in the open interval of 3913-4013 ft. pumping a maximum of 72 bbls. in 15 hours. Later gauged production was 25 bbls. of 14 gravity oil cutting 23% in a 22 hour period.

Rosecrans Wildcat Again Fishing

Wilshire Oil Company's Central Heights No. 1, southwest of Olive and Central Aves., a mile east of the south tip of the Rosecrans field and due north of the Dominguez field, is fishing drill pipe a second time after reaching a total of 5739 ft.

Yorba Linda Well Pumping

Crown Pet. Co. bottomed Page No. 1 at 3316 ft. and bridged to 3030 ft. to complete pumping from 205 ft. of open interval at a 20 B/D net rate. The well makes large volumes of water with the last cut reported at 90%. At the southeast corner of Richfield and Avocado Aves., D. D. Dunlap Oil Co. has staked location for Howe No. 1.

OIL AND MINING

The entire assets of holding company, consisting of landowners and overriding royalty in 12 oil wells located on Signal Hill and Huntington Beach. Miscellaneous drilling machinery, derricks, lots on Signal Hill and Huntington Beach, also 64 acres of potential oil land located at Arroyo Grande. For further information contact Edgar C. Burge, First National Bank Bldg., Long Beach, California, or phone LB 63988. 12/20b

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San Joaquin Valley

Trico Wildcat Now Deepening

H. H. Magee, Operator, Amalgamated-Happold No. 2 is deepening in shale with streaks of sand at approximately 10,750 ft. This well, located southeast of the Trico field in sec. 15-25s-24e, was a "no dope" test at 10,396 ft. where 7 inch casing was run for trial of reported oil showings. According to usually reliable field sources, the Vedder zone was wet.

Delano Try Scheduled

O'Kane & Brain Inc. is preparing to drill Well No. 84-20 in the Delano area of Kern County. The well is located 330 ft. north and 330 ft. west of the E¼ corner of sec. 20-25s-26e.

Sheep Springs Well Deepening

Rothschild-Bender Oil Operations Anderson No. 1 swabbed wet on test at 3000 ft. and is deepening at 3600 ft. This well has shown large gas volumes at the 2900 ft. level during its original drilling.

Strand Area Well Completed

Superior Oil Co. Houghton No. 38-35 on sec. 35-29s-26e completed at a total depth of 9225 ft. from intervals of gun perforations between 6794 ft. and 6808 ft. flowing under wraps at 157 B/D rate of 35 gravity oil, and 80 mcf gas through an 8/64 inch bean.

World's Deepest Well Progresses

Standard Oil Company's record holder, KCL No. 20-13, on sec. 5-31s-25e in the Coles Levee field of Kern County, continues to drill ahead in shale below the 3 mile depth. Last reported at 15,862 ft., progress of the well will necessarily be slow owing to hard formation encountered and unusually long time-lag in coming out and re-entering the hole.

BUY WAR BONDS

Coalinga Drilling Yet Continues

Standard Oil Company continues its moderate drilling program in the Coalinga shallow field area with three strings at work and several projects staked ahead of the drill.

The Texas Co. has resumed de-

SAN JOAQUIN VALLEY WILDCATS

Area	Well	No.	Section	Depth	Status
	Fresno County				
Burrel	General Pet. Corp., Burrel	8-6	26, 16-18	7923	Abandoned
Cantua	Tide Water Assoc. Oil Co., S. P.	82-15	15, 17-15	1770	Drilling
Jacalitos	Standard Oil Co., Well	85-17E	17, 21-15	4103	Completed
	Standard Oil Co., Well	52-17E	17, 21-15	3348	Drilling
	Tide Water Assoc. Oil Co., Well	78-16	16, 21-15	4546	Testing
Helm	British-Am. Oil Prod., Mahoney	1	6, 17-17		Rigging up
NW Raisin City	Seaboard Oil Co., Seaboard-Pure	5-5	5, 15-17	6477	Abandoned
Tranquility	Standard Oil Co., Paterson	74	3, 16-14	3405	Drilling
	The Texas Co., Calif.-Cotton	36-23	23, 16-15	5814	Drilling
	Kern County				
Ant Hill	Amerada Pet. Corp., S. P.	8-15	15, 29-29	4250	Testing
Beardsley	Shell Oil Co., KCL	1	24, 29-27		Cellar
Canfield Ranch	Shell Oil Co., Inc., KCL-B	45-27	27, 30-26	8160	Drilling
	Tide Water Assoc. Oil Co., KCL	68	15, 30-26		Rigging up
Delano	O'Kane & Brain, Well	84-20	20, 25-26		Location
Devils Den	C.C.M.O. Co., Bates	2	20, 25-19	4975	Drilling
	Hillview Oil Co., Hillview	2	11, 25-18	778	Idle
Edison	Gen. Pet. Corp., Tarabino	2	5, 29-29		Grade
	Lumpkin-Taylor & Assoc., Well	1	16, 30-29		Location
	Richfield Oil Corp., Cottonwood-Olcese	1	20, 29-30	2114	Drilling
	Richfield Oil Corp., King	1	31, 30-30	1566	Abandoned
Fruitvale	General Pet. Corp., Kernlandia	84-16	16, 29-27	6212	Drilling
Greeley	Western Gulf Oil Co., KCLA	44-22	22, 29-26	4760	Drilling
	The Texas Co., KCL	77-32	32, 29-25		Grade
Gould Hills	Union Oil Co., Richardson	34-18	18, 29-21	416	Drilling
Kern River	Wilkern Oil Co., Well	1	17, 28-29	862	Plugging
McKittrick	Americal Pet. Corp., Americal	1	2, 30-31	5450	Redrilling
	Standard Oil Co., McPhee	2-1	36, 29-21	7220	Drilling
Lindsey Hills	Standard Oil Co., Notz	1	18, 28-22	3747	Rep. equip.
Lost Hills	Standard Oil Co., Cahn	58	4, 27-21	2650	Drilling
Magunden	Western Gulf Oil Co., Cohn Est.	1	3, 30-28	6278	Drilling
	Gene Reid Drlg. Co., Scott	1	34, 29-25	3405	Drilling
McVan	Butler Bros., Well	2	14, 27-27	1396	Idle
Mount Poso	J. J. Tavis & Assoc., Well	2	8, 27-28	1152	Drilling
Poso Creek	Tide Water Assoc. Oil Co., Well	4	33, 27-27	2663	Abandoned
	Tide Water Assoc. Oil Co., Well	4A	33, 27-27		Rig
	Independent Expl. Co., Conoco	32	33, 27-27	2380	Completed
Round Mt.	Bender Drilling Co., Vedder	14-1	14, 28-28	2660	Cleaning out
	Bender Drilling Co., Vedder	20-1	20, 27-28	2306	Abandoned
	Gen. Pet. Corp., Larkins	2	10, 28-28	2765	Abandoned
	Gen. Pet. Corp., Schaller	1	10, 28-28		Grade
Sheep Springs	Independent Expl. Co., Salt Creek	66	17, 29-21	3376	Drilling
	Rothschild-Bender Oil Ops., Anderson	1	20, 29-21	3600	Drilling
	Rothschild-Bender Oil Ops., Sheep Springs	3	17, 29-21	3730	Abandoned
	Rothschild Oil Co., Exco	1	21, 29-21		Rigging up
	Trico Oil & Gas Co., Woods	1	16, 29-21		Rig
Semitropic	Standard Oil Co., Fullerton	1	25, 27-23	13979	Drilling
So. Belridge	Bandini Pet. Co., Bacon	1	27, 28-20	10495	Drilling
	Superior Oil Co., Crocker	1	13, 29-21	4468	Idle
	Superior Oil Co., Moor	1	15, 29-21	3360	Abandoned
	Superior Oil Co., Moor	2	16, 29-21	3728	Drilling
Strand	Standard Oil Co., Robbins	25-35			Rigging up
	Standard Oil Co., Brittain	61-2	2, 30-26	11009	Testing
	Superior Oil Co., Houghton	38-35	35, 29-26	9225	Completed
Sunset	T. W. A. Co., McBean	86-36	36, 12-23	10412	Drilling
Tejon	Drilling & Prod. Co., O.M.B.	37-33	33, 11-19		Rigging up
	M. Metzenbaum, Well	34-4	34, 11-19		Location
	Richfield Oil Corp., Tejon	A-67-35	35, 11-19		Rigging up
	Reserve Oil and Gas Co., Well	33-7	33, 11-19	2765	Pumping
Ten Section	Richfield Oil Corp., Old River, KCL	2	3, 31-26		Rigging up
Trico	Magee, H. H., Opr., Amal-Happold	2	15, 25-24	10750	Drilling
W. Edison	Richfield Oil Corp., Smith	1	1, 30-28	4875	Drilling
	Kings County				
Pyramid Hills	Pyramid Prod. Co., Spreckles	1	27, 24-18	3088	Rigging up
Reef Ridge	Shell Oil Co., Crow	41-2	2, 23-16		Cellar
Stratford	So. Calif. Pet. Corp., Socal-Bergman	88-32	32, 19-20	9360	Drilling
	San Luis Obispo County				
Midway	Richfield Oil Corp., Temblor Hills	1-1	36, 31-21	6244	Drilling
	Richfield Oil Corp., Temblor Hills	2-1	27, 32-22	866	Drilling
	Richfield Oil Corp., Temblor Hills	2-2	27, 32-22	2399	Drilling

velopment of its holdings in the field with a multiple well program. Last completed for this company was well No. C-11, on sec. 32-19s-15e, which bottomed at 2995 ft. to complete on the beam for 152 barrels daily of clean oil. Shell Oil Co., Inc. has several drilling projects staked for its acreage here and work is expected to be under way soon.

Aga Oil Drilling At Mount Poso

Aga Oil Company S. P. No. 10, in the northeast quarter of sec. 3-27s-28e at Mt. Poso, is drilling Vedder oil sand at 1416 ft. after topping the age at 1393 ft.

Edison Outpost Blows Gas

The British-American-Capital Co. Portals No. 43-3 blew an estimated 15-20 million cubic feet of gas and no oil from the interval of 4663-4837 ft. At last report, the well was in basement at 5551 ft. after finding the top at 5533 ft. The Vedder is reported absent at this location.

Greeley Well Completed

Standard Oil Co. Nord Unit No. 2, on sec. 20-29s-28e at Greeley, completed in oil sand at 11,275 ft. flowing 628 bbls. per day clean 37.5 gravity oil and 555,000 cubic ft. of gas through a 42/64 inch bean. The company is rigging up to drill Wegis Unit No. 2 on sec. 21 of the township. The company is also working on KCL Nos. 11-44, 11-45 and 12-19 in this field.

Poso Creek Well Pumping

Atlantic Oil Co. Sesnon No. 5, on sec. 17-28s-27e, completed at 2979 ft. in intervals open from 2740-2851 ft. pumping 42 bbls. of clean 14.9 gravity oil. On sec. 28-28s-28e, in the Kern River field Rio Kern Oil Co. is completing Well No. 8 after bottoming in sandy shale with streaks of oil sand at 523 ft. and cementing 8⅝ inch casing at 399 ft.

Paloma Well Completed

Western Gulf Oil Co. Paloma Unit No. 78-34, on sec. 24-31s-26e, completed at 10,866 ft. from gun perforated intervals 10,420-10,845 ft. flowing a settled 601 B/D 47.8 gravity clean oil and 274,000 cubic ft. of gas through an 18/64 inch bean under pressures of 2750/3000 lbs.

Pleasant Valley Well in Oil Sand

R. S. Lytle, Oper. Well No. 5-28F is drilling in oil sand at 9161 ft. after entering the zone 9105 ft. The top of the Kreyenhagen was placed 7573 ft. On sec. 29-20s-16e the Standard Oil Co.'s Pleasant Valley Farms No. 73-29F is spot coring shale at 7788 ft. To the north, in the Coalinga Eocene field, Edwin W. and Harold R. Pauley are rigging up to drill Crandall No. 42-18 in the northwest quarter of sec. 18-19s-16e.

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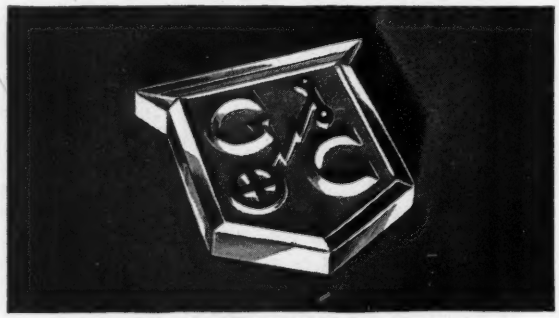

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War demands and shoe rationing quickened our consciousness of the increasing importance of petroleum oils and derivatives in the manufacture of quality leather goods—and artificial leather, too! Quality in petroleum products, for which the chemist strives, depends greatly on the efficiency of emulsion removal from the crude. For years, Tret-O-lite compounds have served oil producers everywhere, in the effective and economical treating of "cut" oil.

Profound laboratory and field knowledge of emulsion problems plus scores of tested and proved Tret-O-lite compounds, insure unqualified efficiency and speedy service. And equally competent is your Tret-O-lite field engineer, located near you.

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Oil is Ammunition • Treat it Right

Tret-O-lite
REG. U. S. PAT. OFF.

DEHYDRATING **DESALTING**

Coastal and Northern District

Tehama County Well To Test

The Texas Co. Jelly Bend No. 18-8, on sec. 8-29-2w, is preparing to run electric log and test after reaching 6781 ft. The Company will soon move into the Winchester Lake area of Yolo County to drill Winchester 8 No. 1 located 2650 ft. north and 2850 ft. west of the southeast corner of sec. 4-6n-4e.

Watsonville Area Project Spudded

Gen. Pet. Corp. Vierra No. 1 on sec. 7-13s-2e southeast of Watsonville in Monterey County is drilling at shallow depth. At last report, the company was repairing equipment. The well is located 3862 ft. south and 1841 ft. west of the northeast section corner.

Amerada Plans Rio Vista "Cat"

Amerada Pet. Corp. is rigging up to drill Church No. 1 in the Rio Vista area of Solano County. The project is located 710 ft. south and 707 ft. west of the north quarter corner of projected section 5-5n-2e.

New Bardsdale Well Scheduled

San Marino Oil Co. is preparing to drill Capital Crude No. 3 on sec. 7-3n-19w in the Bardsdale field of Ventura County. The company's No. 2 in the same section is completed at 2940 ft. pumping 105 B/D clean 28.5 gravity oil. Wilshire Oil Company's C. E. Dryden No. 1 in sec. 7-3n-19w, bottomed at 5874 ft. is standing with 7 inch cemented on bottom.

Shiells Canyon Well Planned

John Schumacher is planning to drill on sec. 3-3s-19w at Shiells Canyon in Ventura County. Currently working in the field is The Texas Co. whose Shiells No. 152 was bottomed at 2960 ft. and is preparing to re-rig pump after the pump stuck while making 99 bbls. in 12 hours.

Cat Canyon Well Abandoned

Union Oil Co. abandoned Palmer-Stendel No. A-1 at 4071 ft. on sec. 29-9n-32w. On sec. 26 of the township the company's B-1, in the same leasehold, is standing with 8⅝ inch casing cemented at 5063 ft. after reaching a total depth of 5781 ft. In the nearby Foxen Canyon area, Four-Five-Six Oil Company Wickenden No. 1, on sec. 34-9s-32w, is drilling near 1500 ft. after cementing 10 inch casing at 300 ft.

Oxnard Area Well Drilling

Lloyd Corp., Ltd. Todd No. A-1, projected deep test of the Oxnard heavy oil producing area, is drilling and spot coring at 3410 ft. No data has yet been released concerning the findings in the upper reaches of the hole.

Contra Costa "Cat" Rigging

Shell Oil Co., Inc. is rigging up on East Bay No. 1 in the Lafayette area of Contra Costa County. The well is located 1500 ft. north and 2400 ft. east of the southwest corner of section 13-1n-3w. On sec. 34-2n-2e, in the Neroly area of the county, the company plans to drill Jacuzzi No. 1.

BUY WAR BONDS

COASTAL COUNTIES WILDCAT

Area	Well	No.	Section	Depth	Status
	Santa Barbara County				
Cat Canyon	Union Oil Co., Santa Maria Realty	1	10, 9-33	5397	Drilling
Foxen Canyon	Four-Five-Six Oil Co., Wickenden	1	34, 9-32	760	Drilling
Gato Ridge	Barnsdall Oil Co., Pezzoni	2	15, 8-32	3299	Standing
Gaviota	Standard Oil Co., Hollister	1	35, 5-33		Rig
Los Olivos	Hub Oil Co., La Laguna	1	7, 7-30	4023	Drilling
Purisima	Whittier Assoc., Barham	2	11, 7-32	3726	Pumping
	Ventura County				
Camarillo	Barth, D. A., Well	1	32, 2-20	520	Idle
Ex-Mission	Union Oil Co., Adams	42	19, 4-21	3034	Drilling
Eureka Canyon	El Rika Oil Co., Well	8	33, 4-18		Location
Happy Camp	Cal-Camp Oil Corp., Harrington	1	21, 3-19		Grade roads
Hopper Canyon	Dodge, Inc., Signal	7	13, 4-19	2673	Idle
Ojai	Ellington, L. E., Well	1	8, 4-21	981	Drilling
Oxnard	Lloyd Corp., Ltd., Todd	A-1	6, 1-22	3410	Drilling
Santa Paula	Standard Oil Co., Santa Paula	1	10, 4-20		Grading roads
Sespe	Assoc. Pip. & Eng. Co., A.P.&E. Co.	1	5, 5-19	300	Drilling
	Volunteer Pet. Co., Tar Creek	3	28, 5-19	2373	Bailing
	Merchants Pet. Co., Well	9	1, 4-20	415	Drilling
South Mt.	Los Nietos Co., L.B.H.	1	22, 3-21	4244	Drilling
	Wilshire Oil Co., Petit	2	16, 3-20		Rigging up
Timber Canyon	Hickey Noble J., Temple	1	22, 4-21	775	Idle
	San Luis Obispo County				
Arroyo Grande	McDuffie, Wm. C. Dollie	3	6, 32-13	2288	Idle
Tar Springs	Amerada Pet. Corp., Tar Springs	1	25, 31-14	2787	Drilling

NORTHERN COUNTIES WILDCATS

County	Well	No.	Section	Depth	Status
Colusa	Standard Oil Co., Davis	1	36, 18n-2w		Location
Contra Costa	Shell Oil Co., East Bay	1	13, 1n-3w		Rigging up
	Shell Oil Co., Inc., Jacuzzi	1	34, 2n-2e		Location
Glenn	Standard Oil Co., Torres	1	12, 18n-2w	4829	Drilling
Monterey	General Pet. Corp., Vierra	1	7, 13s-2e	155	Drilling
Sacramento	Shell Oil Co., Elk Grove	9-1	17, 7n-6e	430	Drilling
San Benito	Panoche Pet. Co., Panoche	1	24, 16s-10e	843	Idle
Solano	Amerada Pet. Corp., Church	1	35, 5n-2e		Rigging up
	Oberholtz, A., Lambie	1	22, 4n-1e	4650	Drilling
	Shell Oil Co., Lambie	1	25, 4n-1w	2617	Cleaning out
	Shell Oil Co., Lambie	1A	25, 4n-1w		Cellar
	Standard Oil Co., Suisun	4	5, 3n-1w	4825	Redrilling
	Standard Oil Co., Suisun	5	31, 4n-1w	3468	Drilling
	Standard Oil Co., Fontana	1	23, 3n-1w	7944	Fishing
	Standard Oil Co., Fontana	2	32, 4n-1w	4110	Drilling
	Standard Oil Co., Fontana	3	9, 3n-1w		Foundation
Stanislaus	Continental Oil Co., Azevedo	1	27, 4s-7e	2190	Drilling
Sutter	Buttes Oilfields, Inc., Buttes-Ward	1	2, 15n-1e		Rigging up
Tehama	Superior Oil Co., Saldubehere	1	12, 24s-3w	9225	Testing
	The Texas Co., Jelly-Bend	18-8	8, 29n-2w	6781	Testing
Yolo	The Texas Co., Winchester	8-1	4, 6n-4e		Location

Glenn County Well Drilling

Standard Oil Company's Torres No. 1, on sec. 12-18n-2w in the Princeton area, was last reported in shale at 4829 ft. after cementing surface casing at 968 ft. with 800 sacks.

Huasna Try Yet Coring

Amerada Pet. Corp. Tar Springs Ranch No. 1, on sec. 25-32s-14e in the Huasna area of San Luis Obispo County, is coring ahead in brown shale at 2787 ft. No showings have yet been reported.

Eureka Canyon Work Resuming

El Rika Oil Company is preparing to drill Well No. 8 on its holdings in sec. 33-4n-18w in Ventura County.

South Mountain Try Coring

Los Nietos Co. LBH No. 1 on sec. 22-3n-21w is coring gray sand and oil sand at 4244 ft. In the field proper British-American Oil Prod. Co. Richardson Ranch No. 1, on sec. 13-3n-21w, is drilling in the grass roots at 250 ft. F. E. Fairfield South Mountain No. 2, sec. 19-3n-20w, is fishing drill pipe after reaching only 100 ft. Pacific Western Oil Corp.'s operations are comprised by Yale Richardson No. 3, drilling at 3555 ft., foundation poured for No. 4 and a grade for Richardson Estate No. 2.

Lloyd Completes at Ventura Ave.

Lloyd Corp., Ltd. has completed its Well No. 14 at 10,963 ft. flowing a 600 bbl. per day rate clean 34 gravity oil and 630,000 cubic feet of gas through a 20/64 inch bean. Reduced to a 16/64 inch bean, the well makes 268 B/D 34.3 gravity oil cutting 1.9 and 198 mcf gas under 300/1750 pounds pressure. The company has poured foundations for project No. 15.

Gen. Pet. Corp. is fishing liner to redrill and deepen its 9000 ft. Barnard No. 15A in the northerly central section of the field. Recent completions in the field are Shell Oil Company's Gosnell No. 35 which makes 500 bbls. through a 13/64 inch bean and Tide Water Assoc. Oil Company's Lloyd No. 86 which flows 568 bbls. through a 28/64 inch bean and the company's V. L. & W. No. 24 which flowed 787 bbls. per day through a one inch bean.

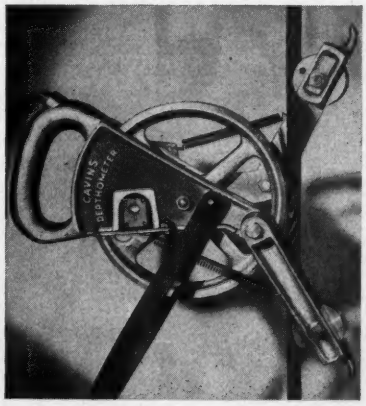
Purisima Hills Well Pumping

Whittier Associates Barham No. 2, in sec. 11-7n-32w, is pumping from the interval 2325-1815 ft. at a diminishing rate. Starting at 105 B/D initial the well was last reported making 36 bbls. per day of 14.5 gravity oil, cutting 9%.

Squaw Flats Well Delayed

Associated Piping & Engineering Co. Well No. 1, on sec. 5-5n-19w in the rugged terrain north of the Sespe field is, delayed by washed out roads after drilling to 300 ft. Owing to the nature of the hills it is believed that some time will be required to replace the roads badly washed out in last week's storms.

The CAVINS DEPTHOMETER



For quick and accurate well measurements when running bailers, swabs, etc., on sand line. This device is rapidly being adopted by many producers as standard equipment for well pulling crews.

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Telephone, Long Beach 485-65

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Operates on measuring or wire line. Multiple recording can be made with one round trip in the hole.

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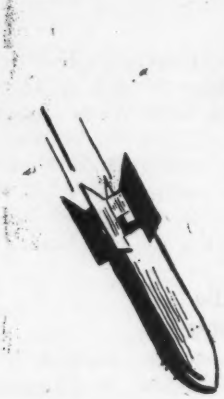
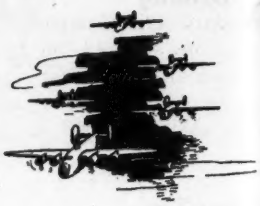


It takes 12,500 gallons to train a single pilot.

Half of the supplies shipped to our army overseas are petroleum products.



To go 100 miles, one armored tank division needs 25,000 gallons of gasoline.

Oil

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On a single 6-hour flight, 1,000 four-motored army bombers use, on the average, 1,850,000 gallons of fuel.

You know, in these never-to-be-forgotten days of trying to meet an ever-increasing demand for oil, we are impressed with this simple, but important fact:

Drilling is like blasting the enemy out of his stronghold—you have to have *better* equipment in order to come out ahead.

You don't have to take our word for it. Records over a period of many years prove how Wilson Power Rigs have *Set the Pace*. Now, when the need is greatest, they are demonstrating their greatest worth!

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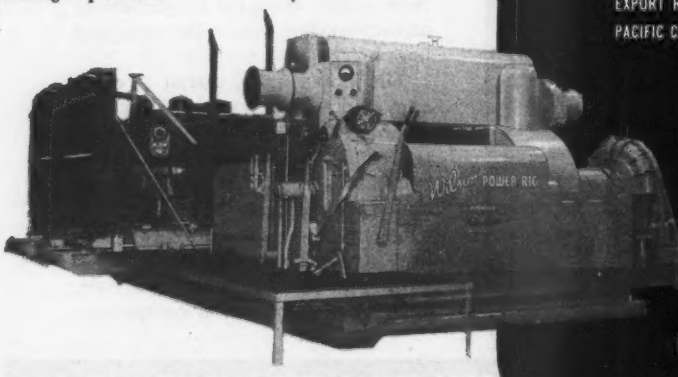
PACIFIC COAST DIST: H & B SALES CO. LTD., LONG BEACH, CALIF.

IMPORTANT WILSON FEATURES...Flame- Ground and Polished Alloy Steel Brake Rings— (2) Balanced Drum and other rotating parts; (3) Manual Drum Clutch Controls; (4) Vacumatic Tra sion Speed Changer; (5) New Method of Increasing L of Bearings and Shafts; (6) Cradle Mounted Hydromatic Brake with instant engaging clutch lever controlled from driller position; (7) Improved Packing System in Water Box; (8) High and Low Speed Friction Drum Clutches, with finger-tip controls.



Wilson

MANUFACTURING COMPANY, INC.
WICHITA FALLS, TEXAS

H & B SALES CO. - Pacific Coast Representative

2875 Cherry Ave. - Long Beach 6, Calif. - Phone 41659

THIS LAUGH

OFF!!

A lunatic asylum inmate being examined for dismissal was asked: "What are you going to do when you get out of here?'

He replied: "I'm going to get me a sling shot and come back and break every damn window in this place."

After another six months, the same question was again put to him.

"Well, I'm going to get a job," was the reply.

"Fine," said the examiner. "And then what?"

"Then I'm going to buy a big car."

"Good.'

"And then I'm going to meet a beautiful girl."

"That's wonderful."

"Then I'm going to take her out driving on a lonely road."

"Yes."

"And I'm going to put my arm around the girl."

"Yes."

"Then I'm going to grab her garter, make a sling shot, and come back here and break every damn window in the place."

In the smokeroom of the big hotel the Scot had been boring everyone with tales of the great deeds he had done.

"Well, now," said an Englishman at last, "suppose you tell us somethink you can't do, and by jove I'll undertake to do it myself."

"Thank ye," replied the Scot, "I canna pay ma bill here."

She: "Would you like to see where I was operated on for appendicitis?"

He: "No, I hate hospitals."

G.I.: "Say, that was some blonde with you last night. Where did she come from?' '

Gob: "I dunno, I just opened my wallet and there she was."

A large dance was going on at a servicemen's center and a British sailor was jitterbugging gracefully with a young thing in a very low-cut down. Finally the tar blurted out: "Beg poddon, Miss—is the V for victory?"

The young thing nodded. "That's right," she said sweetly, "but the bundles are not for Britain."

"Daddy, our next door neighbor wants to borrow our corkscrew."

"Okay, son," said the old man reaching for his coat. "You stay here and take care of things. I'll take it over."

Don't blame anyone for taking candy from a baby these days. Where else can you get it?

Fay: "Does your boy friend have ambitions?"

May: "Oh, you bet. Ever since he's been knee high."

Office Manager: "Pardon me, young lady, but in the matter of your dress, don't you think you should show a little more discretion?"

Steno: "My gosh, some of you fellows are never satisfied."

Colonel: "Your reports should be written in such a manner that even the most ignorant may understand them."

Sergeant: "Yes, sir, what part is it that you don't understand?"

In the grammar lesson one day the teacher wrote on the blackboard:

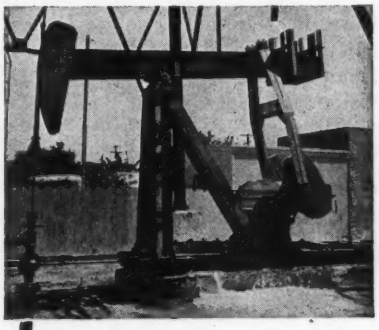
"I didn't have no fun at the seaside."

Then she turned around to her pupils and said to one:

"Roland, how should I correct that?"

"Get a boy friend," he answered.

Little Audrey nailed the bathroom door shut and then she laughed and laughed, because she knew her father was having a beer party at the house that night.



Does Oil Cost You Too Much?

Of course what we say is not important. Call it advertising. But what JENSEN owners think is ALL-important. So, when you meet a producer who owns JENSEN Units, ask questions. Pin him down. If it's true that costs can be cut with JENSEN Units, naturally you want to know it.

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EXPORT OFFICE: 50 Church St., New York City

Safety Award to Standard of California

National recognition was given on Nov. 13 to the employee safety program of Standard of California when three of its operating units won the National Safety Council's "Distinguished Service to Safety" award.

This is the nation's highest form of recognition for industrial safety records. Only three other such awards, all to shipbuilding firms, have been made West of the Rocky Mountains since Pearl Harbor.

The three Standard units honored were the National Gasoline Departpartment, the Marine Department's Inland Fleet, and the Drilling Division.

Accepting the award from Earl F. Campbell, Western regional director of the council, President Harry D. Collier, of Standard gave his "highest praise" to the men who had planned the safety program and to the employees for their cooperation.

Campbell declared the record to be "distinguished" in war production and said it was an "unusual accomplishment" that three of the Company's operations had qualified. One requirement to qualify is reduction of at least 10 per cent in injury rates.

A certificate of safety and an "S" pennant go with each award.

Left to right: Robert E. Donovan, Standard of California safety engineer; J. H. McEachern, Manager, Marine Department; Harry D. Collier, President, Standard of California; Earl F. Campbell, Western Regional Manager, National Safety Council; T. L. Taggart, Manager, Natural Gasoline Department; J. E. Toussaint, General Manager of Operations, Producing Department.

Baker Awards Service Pins

The third Annual Service Pin Banquet of the California Division of Baker Oil Tools, Inc. was held on October 27, 1944 coincidentally with nationally celebrated Navy Day. A total of 29 Service Pins were awarded for periods of employment of 5, 10 or 15 years, including the following employees now serving in the Federal Armed Forces: R. G. Brandt, F. S. Fobes, G. H. Frahm, S. W. Martin, A. E. Pruett, Jr., C. B. Walker, R. N. Waters, E. W. Wilkins.

C. A. McDonald, Production Manager of the Huntington Park Plant, and a 15-year man (at left in group at speakers table) made the acceptance speech on behalf of service pin recipients.

The highlight of the evening was a talk by Lt. Walter Kane on his experience during the invasion of Saipan. An interesting sidelight to this banquet was announcement of the award to this concern on October 21, 1944 of an added star to their Army-Navy "E" Flag, for "continuing to maintain the high standard which you set for yourselves and which won you distinction more than six months ago."

Front row, left to right: (the figures after each name denote years of service: K. F. Polzin 5, C. T. Warren 15, H. C. O'Neil 5, H. E. Willey 10, G. L. Edler 5, F. C. Markley 10, F. W. Keltka 5; second row, C. M. Byron 10, W. A. Spence 10, Margaret M. Martin 5, C. M. King 10, R. S. Kail, a Central Division 15-year man; R. W. Henderson 10, K. L. Leeg 5; top row, R. B. McCannon 15, C. A. Jensen 10, L. J. Maguin 15, H. W. Bradshaw 10. Not in this picture, C. A .McDonald 15, A. W. Hess 5, R. E. Mittnacht 5.

Speakers table, left to right: C. A. McDonald, S 1/C Harry Fields, Lt. Harry Graham, Commander Jonah Jones, Lt. Walter Kane, T. Sutter, R. C. Baker, R. S. Kail, Lt. Paul A. Sailer, C. T. Warren K. F. Polzin, W. A. Lorenson, L. J. Maguin.

A.A.P.G. Holds Annual Coast Meeting

The annual meeting of the Pacific Section of the American Association of Petroleum Geologists was held November 9-10 at the Ambassador Hotel, Los Angeles.

On the program were eleven papers, nine of which were on phases of California oil geology. Many guests attended the Friday afternoon session to hear two talks of more general interest on the Middle East oil situation by Mortimer Kline, and on new oil and gas discoveries in California through the third quarter of 1944 by A. I. Gregersen, District Geologist for PAW.

Glenn Bowes

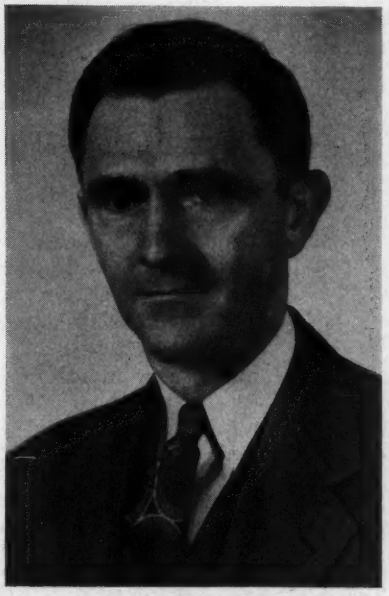
Mr. Kline indicated the importance of Middle East oil in future international policy. He brought out first that oil reserves as large as the reserves of the entire United States already had been discovered in the Middle East by the drilling of fewer wildcat wells than were drilled in California in the first nine months of 1944. He then outlined some of the international intrigue involved in gaining and keeping concessions in this key oil region and pointed out some of the difficulties of maintaining the American position. Even the large American companies, he said, are hard put to compete against the British government, which is what the situation amounts to because

Robert T. White

in 1914 the same Winston Churchill who is now Prime Minister bought 56 per cent of the stock in the Anglo-Iranian Oil Company for His Majesty's government.

Mr. Kline was associate general counsel for PAW, special consultant for PAW, and general counsel for Petroleum Reserves Corporation before his recent retirement to private practice in Los Angeles.

Dr. Judson Anderson of Johns Hopkins University described the geological setting of the oil fields of Colombia, South America. Dr. Anderson's visit to California was under the sponsorship of the Distinguished Lecturer Committee of the American Association of Petroleum Geologists.



Vincent Vandiver

Another guest speaker was Dr. Norris Johnston, physicist of General Petroleum Corporation, who showed that by pure physical phenomena, the tilting of an oil-water interface can be accomplished to the extent of several hundred feet by differential permeability without geological movement.

A. I. Gregersen reviewed 1944 California oil and gas discoveries through the third quarter. His figures showed a very successful discovery percentage numerically but very small reserves. He pointed out that, similar to last year, we are using oil five times as fast as we are finding it.

Glenn Bowes, Continental Oil Company, was elected president of the Pacific Section for the ensuing year. Robert T. White, Barnsdall Oil Company, was made vice president, and Vincent Vandiver, Seaboard Oil Company, was elected secretary-treasurer.

Belridge Deep Test Re-Rigging

Bandini Pet. Co. Bacon No. 1, deep test in the So. Belridge area, on sec. 27-28s-28e, is moving in heavier drilling equipment after coring to 10,495 ft. and cementing 7 inch casing on bottom.

Buena Vista Wells Completed

North American Oil Cons. Well No. 81, which blew in flowing a large volume of oil while washing perfs, was killed with 130 lbs. mud and completed flowing a 525 B/D rate 30 gravity clean oil through a 14/64 inch bean. Bottomed at 3868 ft. the well finished from 60 ft. of perforations below a cp job at 3772 ft. On sec. 6-32s-24e, the Honolulu Oil Corp. Well No. 108 completed at 3596 ft. flowing a settled 264 barrels of clean 30 gravity oil and 320,000 cubic ft. of gas through a 15/64 inch bean. Work continues at an even pace in this field with Honolulu, Murvale, No. Amer., Standard, Tide Water and Union Oil participating.

Nomads November Meeting

Tales of the old Army in the Philippines, just after the United States took it over many years ago, entertained the ninety-two members and guests at the regular dinner meeting of the Los Angeles Chapter of Nomads held at the Mayfair Hotel in Los Angeles, Wednesday evening, November 8, 1944. President Roland Smith opened the meeting with the Pledge of Allegiance to the Flag and then announced the following names of men selected by the membership to serve on the Nominating Committee for 1945 officers: Bill Bettis, Hi Cassidy, Elmer Decker and Ted Sutter, members; Web Wilson, Earl Daniels, Al Farrow and Custer Morrow, alternates.

The Master of Ritual, Hi Cassidy, found only two of the five initiates on hand but proceeded to give these two, H. K. Browning and Larry Coker, both Associate Members, the works.

The meeting was then turned over to the Master of Ceremonies for the evening, George Anderson, who introduced the first speaker, Lt. Larry Kelley of the U. S. Navy. Lt. Kelley has been a P. T. boat commander in the South Pacific action and told of his experiences before he was wounded and sent back to the States for hospitalization. The main speaker of the evening was Major George Steunenberg, U. S. Army, retired, who saw plenty of action in the old days. He was present at the raising of the flag at Hawaii and was selected to raise the flag in the Philippines. Fortunately he could not locate a flag because the officer who did raise it got killed with a sniper's bullet. After a brief intermission, war pictures with sound were shown.

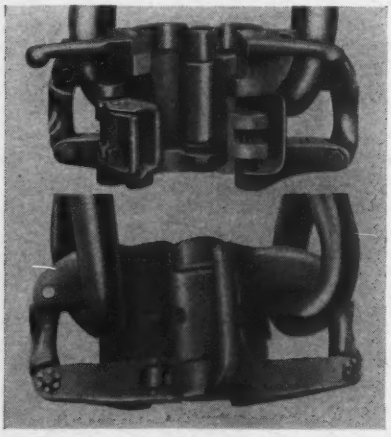
Lt. Larry Kelley
(Tells Nomads of interesting experiences as PT boat commander)

Among those present were G. L. Kothny of the New York Chapter and C. E. Whitney of the Houston Chapter. Also in attendance was Charles Potter of the Richmond Petroleum Company from Venezuela, one of the Chapter's Honorary Members.

Among the foreign guests at the meeting were: V. C. Boston and L. W. Wiedey of the Tropical Oil Company from Colombia; C. E. Davis of the Arabian-American Oil Company from Saudi, Arabia; E. L. M. Trafford of Trinidad Leaseholds from Trinidad; G. N. Akin and H. C. Keck of the Petroleum Development Co. from Qatar; H. C. Creath of Texas Company from Venezuela; R. L. Babcock of Colombian Petroleum from Colombia; Art Eadie of Richmond Petroleum from Colombia, and F. G. West of Caribbean Petroleum from Venezuela.

New "AA" Elevator

A new elevator with an improved design feature has been released by Byron Jackson Co. for field service. In addition to the safety latch, the



new type AA elevator has a cam and roller spreading device that holds the elevator open against the normal closing action of the links.

It is no longer necessary to force the elevator downward at an angle out of normal operating position in order to keep it open while being raised for another stand of pipe. This is of particular importance to the derrickman. With this new feature the elevator arrives at the fourble board in level operation position. The usual impact of the drill pipe of an easy quick pull frees the spreading cam and allows the elevator to swing closed.

This new spreading cam eliminates the dangerous and inefficient process of the derrickman's leaning over and following the elevator for the last few feet of travel in order to get it into operating position.

Material of the new "AA" Elevator is heat-treated, high alloy steel. The top bore is flame hardened to guard against upsetting. The safety factor is rated four to one, 300 tons.

For further information write to Byron Jackson Co., P. O. Box 2017 Terminal Annex, Los Angeles 54, California.

Water-Flooding First Practiced 38 Years Ago

Flooding depleted oil sands with water to flush out residual oil was first carried out in the Bradford Field, Pennsylvania, in 1907. Since then the practice has been found applicable to many other oil-producing areas throughout the U. S. Full-scale trials are now being carried out in California.

Montebello Deep Test Plugged

Standard Oil Company's Baldwin 129, on sec. 1-2s-12w, bottomed at 8024 ft. in gray sand and bridged to 3665 ft. where a 7 inch combination string perforated from 3246 to 3515 and 3575-3663 ft. was landed and cp'd for a completion in the upper zone.

FOR SALE

Four lots in Summerland for $175.00. C.R.F. P. O. Box 958, St. Louis 2, Mo. 11/20d

A. M. Buxton Appointed Assistant Sales Manager for Cooper-Bessemer Corporation

A. M. Buxton has been promoted to assistant sales manager of The Cooper-Bessemer Corporation, it is announced by S. E. Johnson, general sales manager, with headquarters at Mount Vernon, Ohio.

A. M. Buxton

In addition to sharing responsibilities of the general sales manager, Mr. Buxton will direct the Company's oil and gas field sales, according to Mr. Johnson, since he has been working closely with these fields in his former position at the Company's Tulsa office.

Mr. Buxton has been with Cooper-Bessemer for 20 years. He is 43, married and has one child. He has moved his residence from Tulsa to Mount Vernon.

Cymric Drilling Now Resumed

Victory Oil Co. has resumed development of its holdings at Cymric near the So. Belridge field. Located on sec. 26-29s-21e, Well No. 24 is rigging up and Well No. 25 is rigging pump after bottoming in oil sand at 1200 ft., while Well No. 26 is pumping 50 bbls. per day of clean oil from 108 ft. of zone above bottom at 1038 ft.

Williams Field Work Resuming

Shell Oil Co. is preparing to resume drilling in the Williams field near South Belridge. The company has staked location for Williams No. 605-6 at a point 2756 ft. south and 4888 ft. east of the northwest corner of sec. 6-28s-28e. In the South Belridge field proper Belridge Oil Co. and General Petroleum Corp. continue their drilling programs with Belridge recently announcing a new series of locations.

Rio Vista Well Testing

Standard Oil Co. Midland Fee No. 6, on sec. 6-3n-3e, blew gas at rates from ten to twelve million cubic ft. per day from the intervals 5302-5403, 5428-5460 ft. and 5464-5495 ft. A test of the interval 5499-5530 ft. recovered only mud and salt water. At last report, the well was in shale at 5737 ft.

On sec. 35-4n-2e, Amerada Pet. Corp's. J. Mayhood No. 3 was completed in the gun perforated intervals 4450-85 ft., 4495-4505 and 4515-30 ft. for an unestimated yield before shutting in. The company's J. C. Hamilton No. 3 on sec. 24 of the same township is completing from gun perforated intervals after a test at 4360 ft. blew a 7,000 mcf rate; other intervals now open were not incorporated in the test above.

The Texas Co. Welch Fee No. 5 on sec. 32-4n-3e is fishing drill pipe after reaching 5823 ft. A short test of the interval 5428-5458 ft. blew at a 7½ million cubic ft. per day rate.

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Crude Oil Demand for Refining 800,000 Bbl/Day Over Normal

According to a recent PAW survey, crude oil demand by U. S. refineries has increased by nearly 800,000 bbl. daily due to the war.

Economical Refinery Maintenance

with

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A. P. JOHNSTON

1845 E. 57th St. - Los Angeles 11, Calif.

Carrington King

(Continued from Page 3)

tee on petroleum, returned to his seat in the House after an absence of two years. Edward A. Kelly (D., Ill.)—defeated in 1942, when the Republicans picked up several seats in his State—presumably will bring back with him his keen interest in petroleum affairs and will take his place on the petroleum committee—now headed by Representative Clarence F. Lea, chairman of the House Interstate Commerce Committee and dean of the California House delegation.

These were the most important additions and subtractions among the few oil-minded members of Congress. Generally speaking, there will be little change in the make-up of committees which have jurisdiction over oil matters.

One of the principal questions agitating Eastern oil interests at this time is the fate of the great Government-built pipelines — "Big Inch" and "Little Big Inch"—when the war is over.

That these two lines can be operated profitably (but at the expense of the tanker industry) by private enterprise, was the suggestion of Secretary of Commerce Jesse H. Jones, who released an interesting statistical study on the cost and operation of the two War Emergency Pipelines. Briefly, the survey showed that crude could be shipped through the "Big Inch" line at a cost of 38 cents per barrel, compared with tanker charges of 60 cents; Jones figured the products cost through the 20-inch "Little Big Inch" at 25 cents a barrel, as against a tanker rate of 40 cents. Daily average deliveries during September were 320,695 barrels for the crude line and 207,608 for the smaller products line, his figures showed.

Most authorities are inclined to agree with Jesse Jones that private industry will buy up the lines after the war. One suggestion has been made that—in view of the shortage situation developing in the mid-Continent area—the Eastern leg of either pipeline could be utilized to move imported oil to the Middle-West.

PAW is about to lose the last of its assistant deputy administrators. Returning to his pre-war job as general manager in charge of research and development with Standard Oil Co. of Indiana, Bruce K. Brown has handed in his resignation with no particular effective date. Although Brown feels the 100-plus octane program—his particular responsibility—is now organized to a point where he can safely leave PAW, it is understood he has offered to stay with the Government if his services are further needed.

Concrete Tanks for Storing Aviation Gasoline

Due to the scarcity of steel plate, tanks for the storage of aviation gasoline have been successfully constructed from reinforced concrete. One type has a 55,000-gal. capacity and is built to permit complete submergence in groundwater. The tank is 30 feet in diameter and 10½ feet high, with a slab floor 14 inches thick and 12-inch walls. A 10-inch flat slab roof is supported by four 18-inch square columns.

Tejon Well To Test

Richfield Oil Corp. Tejon No. B-55-34 on sec. 34-11n-19w is washing perforations for a production trial after landing 6⅝ inch liner including perfs from 2720-2650 and 2610-2568 ft. on a plug at 2725 ft. Tests on the way down indicate that the well will be productive. The company is preparing to drill Tejon No. A-67-35 as a wildcat in the southeast quarter of sec. 35 of the same township.

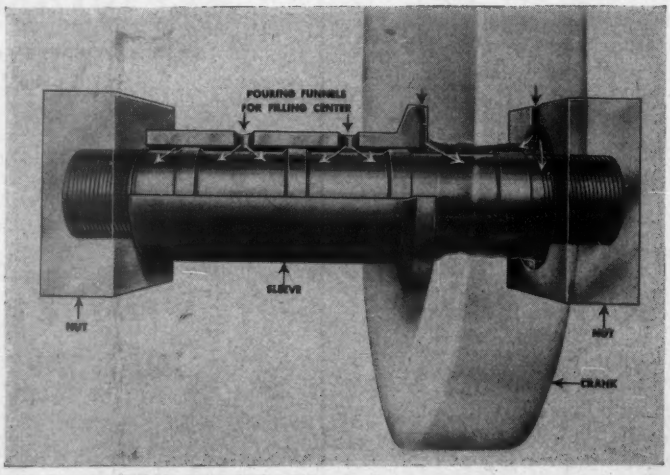
On sec. 33-11n-19w Reserve Oil & Gas Co. Well No. 33-7 deepened to 2765 ft., plugged to 2720 ft. and completed in 165 ft. of zone pumping 110 bbls. daily of clean 18 gravity oil.

Bombers Get One Mile Per Gallon

A modern bomber gets one mile per gallon of 100 octane aviation gasoline.

New Sleeve Flange Crank Pin

For emergency and permanent use, a rugged and effective replacement crank pin has been designed for pumping oil wells. Known as the Heaston Sleeve Flange Crank Pin, this new pin makes it possible to renew crank or wrist pins without shutting down the well for hours or days, irrespective of how badly broken the hole in the crank appears to be.

This crank pin consists of a special grooved pin, flanged sleeve and two nuts. No prior experience is needed to install it. The old worn-out pin is removed and the new pin inserted in the crank. The sleeve is then slipped over the pin and the nuts screwed on. A quick preheating job completes the operation. This simple procedure makes a rigid installation that will outlast the original pin and give permanent service.

George H. Stoddard, who years ago founded the distributing firm of Buck & Stoddard, is placing the pin on the market. Literature may be obtained by writing to him. His office is in the Richfield Building, Los Angeles 13, Calif.